

# Kew Bulletin

PUBLISHED FOR THE ROYAL BOTANIC GARDENS, KEW  
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## No. 1, 1949

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### REVIEW OF THE WORK OF THE ROYAL BOTANIC GARDENS, KEW, DURING 1948

#### General

With the retirement of Sir Alfred Egerton, the Director now becomes the Senior Secretary of the Royal Society and was nominated as a Vice-President for 1949. He also continues to serve as Vice-Chairman of the Agriculture Improvement Council, as Vice-Chairman of the Committee on Colonial Agricultural Research and as a member of the Scientific Advisory Committee to the Cabinet.

As Honorary Adviser to the Imperial War Graves Commission the Director reported on cemeteries in Northern France, Belgium, Holland and Germany, which he visited in August. In his capacity of Honorary Adviser to the Ministry of Labour he attended meetings concerned with the recruitment and employment of scientific manpower.

The Director continues to act as Vice-Chairman of the John Innes Horticultural Research Station, as a Governor and Trustee of Rothamsted Experimental Station, and as a member of the Governing Body of East Malling Research Station, Queen Mary's College and the Royal Holloway College.

Having served as a member of the University Grants Committee for five years, the Director's term of office came to an end in December 1948, but he continues to serve on the Science Sub-Committee of that body.

At the Annual Meeting in 1948, the Director was elected a Vice-President of the Marine Biological Association.

The Director was appointed by the Lord President to be Chairman of the Forest Products Research Committee of the D.S.I.R. and Chairman of the Biophysics Committee of the M.R.C. He was also appointed Fullerton Professor of Plant Physiology of the Royal Institution in 1948.

The total number of visitors to the Gardens in 1948 was 1,721,757, thus continuing the steady increase over the years. The largest attendance in any one month was in May, when 330,722 persons visited the Gardens. December showed the lowest number of visitors, with a total of 12,559. Whit-Monday was again the day with the greatest attendance, and on this occasion 72,591 people passed through the turnstiles.

At the invitation of the Director, Fellows of the Royal Society visited Kew on the 4th June, following the lecture by the Director to the Royal Society on the aim and functions of the Institution. A very impressive exhibition to illustrate the scientific work being carried out in all Departments at Kew was arranged on the ground floor of the Herbarium. A letter of thanks and appreciation was received a few days later from the President of the Royal Society.

The following promotion within and appointments to the staff are recorded :—

*Promotion to Principal Scientific Officer :*

H. K. Airy Shaw—31.12.48

*Appointments as Senior Scientific Officers :*

J. R. Sealy, B.Sc.—5.5.48

J. P. M. Brenan, M.A.—1.9.48

*Appointments as Assistant Experimental Officers :*

P. Taylor—1.9.48

J. Kennedy O'Byrne—1.9.48.

### The Herbarium

Work in the Herbarium has returned to or even exceeded pre-war quantity and quality. The main problem at the present time is how to deal with the great accumulations of specimens awaiting determination and incorporation. The following figures indicate some of the routine work accomplished :—

Number of specimens received for the Herbarium	...	35,185
Number of specimens received on loan	... ..	5,406
Number of specimens sent on loan	... ..	5,025
Number of specimens distributed as duplicates	... ..	4,992
Number of sheets mounted	... ..	15,933

Visits paid to the Herbarium and Library by botanists numbered 4,414. This is an increase of nearly 1,000 over last year.

Allocated posts in the grades of Experimental Officer, Assistant (Scientific), and Preparer have all been filled.

The Herbarium and Library continues to be used by an increasing number of visitors and for longer periods. The following botanists have carried out research on the groups or subjects named.

- I. H. Burkill (*Dioscorea*),
- H. L. Chakravati (Indian Flora),
- E. A. Chenery (Aluminium in Plants),
- G. H. Cunningham (*Polyporaceae*),
- H. Czeaczott (Palaeobotany),
- P. H. Davis (Flora of Asia Minor),
- P. J. Greenway (Flora of E. Africa),
- H. H. Hume (*Camellia*),
- G. H. Johnston (*Magnoliaceae*),
- A. Lourteig (Flora of Argentina),
- E. W. Merrill (Flora of Malaysia),



R. Pichi-Sermolli (Flora of Abyssinia),  
H. Santapau (Bombay Flora),  
N. W. Simmons (Flora of Trinidad and Tobago),  
M. L. Tardieu (*Pteridophyta*),  
P. C. Tsoong (*Sophora* and *Scrophulariaceae*),  
J. W. Vickery (Australian grasses),  
C. Zerlentis (Flora of Greece).

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The scientific staff are very grateful to Colonel E. Armstrong and Mr. W. C. Worsdell for their continued assistance in the translation of papers from various foreign languages. Miss M. M. Whiting has continued to give valuable assistance in re-arranging material from the Indian sub-continent. Since his retirement from the Keepership of the Museums, Dr. J. Hutchinson has been working at the Herbarium mainly on British plants.

The routine, consultative, and curatorship work in the Herbarium has greatly increased. A total of 2,270 enquiries and plant consignments were dealt with in the past twelve months. The laying in of mounted material has been kept up to date. It is pleasant to record that the general standard of collecting has greatly improved.

*Europe, Orient, North Africa.* Work during the year has been concentrated on E. R. Guest's collection from Iraq, the account of the third part of which is being prepared for publication, Mrs. Dickson's collection from Kuwait, and the Flora of Cyprus. Important acquisitions in 1948 include a set of critically determined Moroccan plants from M. Charles Sauvage, material from Spanish territories in N. Africa, the first instalments of P. H. Davis's collection made in Southern Anatolia, and the British herbarium of the late Mr. G. C. V. Last (in which are incorporated the herbaria of Mr. W. C. Worsdell and the late Dr. Saunders).

*China and Japan.* A considerable amount of time has been spent in the working out of Chinese plants cultivated in British gardens. Research has been concentrated on the genera *Camellia*, *Iris*, *Lilium*, and *Nomocharis*.

*India.* Research has been carried out on Indian species of *Canavalia*, *Corchorus*, and *Bignoniaceae*. Dr. D. Chatterjee attended the Symposium on botanical nomenclature at Utrecht in June as representative for India.

*Malaya.* The account of the *Myrtaceae* of the Oxford University Expedition to Sarawak, 1932, was completed and sent to the press. A number of identifications of material from the Forestry Department, North Borneo, specially requested by the Conservator of Forests, were undertaken. These consignments, begun in 1930, have now been resumed after interruption by the war, and it is regretted that lack of staff prevents their being rapidly dealt with. The entire Malaysian material of *Diospyros* in the Herbarium, and the Malay Peninsula material of the *Dipterocarpaceae*, was very kindly rearranged by Miss M. M. Whiting according to Bakhuizen's and Symington's revisions, respectively.

*Tropical Africa.* Extremely valuable collections continue to be received especially from British, Belgian, French, and Portuguese colonies. The standard of the collections is undoubtedly higher than it has ever been

before. Particular reference should be made to collections from Nigeria (Cambridge University expedition), Liberia (J. T. Baldwin), Sierra Leone (F. C. Deighton), Nigeria (R. W. J. Keay), Uganda (W. J. Egging and J. W. Pursglove), Kenya (P. R. O. Bally), Tanganyika (P. J. Greenway), Mozambique (H. G. Faulkner), Angola (through National Herbarium, Pretoria), Northern Rhodesia (A. W. Cruse), and Southern Rhodesia (H. Wild).

Special research has been done on *Marantaceae*, *Otiophora*, *Utricularia*, succulent species of *Euphorbia*, *Ceropegia*, *Crassocephalum*, *Dioncophyllum*, *Ancistrocladus*, *Rhynchosia*, *Tricalysia* and *Amorphophallus*.

*South Africa.* Large additions to the collections have been received from the National Herbarium, Pretoria, the Bolus Herbarium, Cape Town and from private individuals. During the year, a review of the *Rubiaceae* of South Africa was begun and is nearing completion. A bibliography of South African botany has been compiled and is being prepared for publication. A revision and determination of plants in the living collections is in progress. Miss P. Kies has been appointed botanist for South Africa at Kew and is carrying out a review of the flora of the Fauresmith district, with particular reference to the *Compositae* and *Liliaceae*.

*America.* Work has been concentrated on collections sent by the Forest Department of British Guiana and the Trinidad Botanic Garden. The manuscript of *Convolvulaceae* for the Flora of Trinidad and Tobago (prepared by the late Sir Arthur Hill) has been thoroughly revised. Special work has been done on *Bignoniaceae* from Argentina and on *Diospyros* from Amazonia.

*Glumiflorae.* Numerous reports on grasses and grasslands, taxonomic, ecological and economic, have been supplied to correspondents. Research has been largely on Tropical African grasses. A number of genera have been revised and descriptions of new genera and species prepared for publication. Work is in progress on the species of *Eragrostis* from Tropical Africa. Four manuscripts on grasses have been revised for their authors.

A revision of the Malaysian species of *Carex* is being prepared for publication. Investigation of species *Kyllinga*, *Scirpus*, *Kobresia*, and *Carex* from other areas has also been undertaken.

*Cryptogams.* In the Vascular Cryptogams work has been concentrated on the ferns of Tropical Africa, especially those from Nyasaland. Research work is in progress on the genus *Dryopteris*.

Routine naming, laying in, and curatorial work was continued for the *Bryophyta* and *Algae*.

In the mycological department, collections of *Polyporaceae* and *Thelephoraceae* have been determined. Considerable time has been devoted to a study of West Indian *Agaricaceae*. Dr. P. H. B. Talbot completed his two years' residence at Kew and returned to Pretoria in April. He worked mainly on resupinate *Hymenomycetes* with special reference to those in the South African flora. During the past year the senior mycologist has been able to return to her work on resupinate *Basidiomycetes*, and has in preparation a revision of the British species of *Tomentella*, as well as an



annotated list of many species as yet unrecorded for Britain. The assistant mycologist has concentrated his attention on a revision of the British inoperculate *Discomycetes*, the last comprehensive account of which appeared in 1895 (Masee, British Fungus Flora, vol. 4). A monograph of the *Hyaloscyphaceae* including descriptions and figures of 104 species has been completed and sent to press. Opportunity was also taken of N.Y. Sandwith's discovery of aecidia on *Ornithogalum pyrenaicum* to confirm by cross-inoculation that this is the alternate host of the common Barley rust (*Puccinia hordei*).

*Fumigation Chamber.* This was used twenty-three times in 1948. In addition to the routine fumigation of new material, mounted material fumigated included species of the genera *Meconopsis* and *Papaver*, *Malus*, *Compositae* (2 blocks), and *Arbutus*.

Some experiments on the use of modern insecticides in controlling insect attacks in herbaria are being carried out.

*Herbarium Experimental Ground.* This has been very fully used during the year. A considerable number of the beds are being used to house the National Collection of *Dianthus*. A report on the progress made in forming this collection will, it is hoped, be published next year. Experimental research has been continued or begun in the genera *Silene*, *Centaurea*, *Cerastium* and *Dipsacus*.

*Lantern Slide Collection.* Lantern slides on botanical subjects have been brought together and arranged as one collection. This includes the Buller bequest of over 2,000 slides and a fine series illustrating the Royal Botanic Gardens, Kew. Among the latter are the excellent colour slides made by the late Mr. S. F. Ormsby and presented by Mrs. O. Ormsby who has also presented a projection lantern and screen which belonged to her son.

*Index Kewensis.* Compilation of Supplement XI is proceeding. It is intended to issue this as a double volume containing entries from 1941 to 1950 inclusive. Mr. W. V. D. Pieris is now assisting in the compilation in place of Miss S. Wilson.

*Carpological and Seed Collections.* These have received constant additions and the latter is now being re-arranged.

*Spirit Collection.* This has grown very considerably and is now rehoused satisfactorily in the basement of Wing B in steel cabinets.

### The Library

As in previous years routine work in the Library connected with correspondence and bibliographical enquiries of a varied nature, has occupied a considerable amount of time. The addition of a clerical officer to the library staff has, however, enabled progress to be made in classifying and cataloguing the maps and adding them to the general collection where they will be available for use.

During the year we continued to lend books from the Library to other Government Departments and Agricultural Bureaux and also to administer loans to workers on Diatomaceae from the Bentham-Moxon collection of books on this subject.

Books and other publications on *Algae* from the ground floor corridor have been removed to the end of Wing C for the convenience of the Algologist. This has relieved the congestion in the corridor and afforded an opportunity of re-arranging and spacing out other books. All geographical journals have been moved to the Travels Room and now occupy the recently acquired island presses there.

Papers and reprints on fossil plants have now been put into boxes, thus continuing the work begun with the boxing of the general series of tracts. A limited number of volumes have been bound.

As in past years, a number of books have been generously presented by their authors, by members of the staff and others, while some have been sent to us for review by the publishers.

Various publications have been received from the New York Botanical Garden, the Royal Horticultural Society, the Carnegie Institution of Washington, the Empire Cotton Growing Corporation, the Commonwealth Agricultural Bureaux and from many Departments of Botany, Agriculture and Forestry at home, in the Colonies and in foreign countries.

We are again indebted to authors, too numerous to mention here, for reprints of their botanical papers.

A valuable collection of maps has been kindly presented by the War Office while the Ordnance Survey Office has continued to supplement our map collection by sending copies of their maps as issued. The collection has also been enriched by over a hundred maps of Argentina through the courtesy of Dr. A. Lourteig, who is at present working at Kew.

### The Museums

A feature of the normal work during the year has been the relatively large number of enquiries, usually accompanied by specimens, relating to poisonous plants and cases of poisoning in livestock. Yew, meadow saffron and false acacia (*Robinia*) have been among the plants concerned. Seeds of cleavers or goose grass (*Galium aparine* L.) have again been received from the gizzards of poultry and suspected of having been the cause of death. However, feeding tests with fowls (carried out by a private concern) gave no evidence that the seeds could be regarded as harmful.

In connection with a scheme for the improvement of homegrown birch, material from selected trees in several localities has been examined for the Forestry Commission. Trees of good type with smooth bark and straight bole were found to occur in both *Betula pendula* Roth. and *B. pubescens* Ehrh. Some evidence was found that desirable growth characters may be associated with morphological features of the branchlets, leaves and catkins, but a more extensive study is needed of the British birches which constitute a critical group.

Samples of honey alleged to be English and suspected of adulteration were found to contain a considerable proportion of *Eucalyptus* pollen in all samples. The pollen analysis was consistent with the admixture of a



*Eucalyptus* honey with an English honey derived mainly from White clover, a conclusion that was borne out by the flavour and physical properties of the honeys.

The 1948 season favoured the maturation of cones on conifers and this has resulted in an increase in the number of conifer specimens submitted for identification. The favourable conditions contributed to the success of the extensive exhibit of conifers arranged by Mr. F. W. Wyatt at the Royal Horticultural Society's show of Sept. 21-2, for which the majority of the pines were supplied from Bedgebury. Some excellent coning material of *Abies* spp., was obtained for the museum collections and a critical account of the display has been prepared for the Society's journal.

Some aberrant specimens of *Datura* cultivated at Nottingham University as *D. ferox* L. and submitted for identification proved to be hybrids between this species and *D. tatula* L.

The green pea-like fruits found as an impurity in tinned peas proved to be immature fruits of *Solanum nigrum* L. It would appear that with the recent development and use of machinery for hulling or shelling peas in the field this objectionable impurity is more likely to be present than formerly. After the mechanical shelling the peas are transported in tanks of water to the factory for canning. Before being canned they pass over a belt for handpicking of impurities but as the green fruits of *Solanum nigrum* are so like small green peas they are easily missed.

As a result of the acute shortage of drying oils of the linseed type, a number of enquiries on this subject have been received. Several have referred to *Tetracarpidium conophorum* Hutch. et J. M. Dalz., a West African shrub or woody climber with an oleaginous seed which shows promise as a possible commercial source of drying oil.

With the lifting of restrictions on the growing of tobacco on a small scale for home use in Great Britain, many queries have been received relating to the production of tobacco and methods of curing under prevailing climatic conditions. Herbal smoking mixtures have also been a subject of general interest, and the identification of the constituents of herbal tobacco has been carried out on behalf of interested parties.

Among the special exhibits displayed in the Museums during the year, that relating to the Colorado beetle was of special interest to the general public, particularly during the summer months when this potato pest received much publicity owing to fresh outbreaks. The exhibit includes coloured models which appear to be of some historical interest. They were received from Germany in 1877 with a descriptive pamphlet. Similar sets are said to have been widely distributed in Germany to agricultural institutes, schools, farmers' clubs, etc., by order of the German Government of that time.

Specimens donated during the year include interesting samples of fibre board prepared from papyrus (*Cyperus papyrus* L.) in Uganda and wood (a plank specimen) of *Afrormosia* (*A. elata* Harms.?) from the Gold Coast. The latter bears a strong resemblance to teak.

During the year the painting of the museums, long overdue on account of the war, has considerably improved their outward appearance. It is



hoped that internal decorations, also badly needed in all four museums, will be possible in the near future.

Considerable headway has been made in resurfacing the timber specimens in No. 4 Museum. Some of these plank specimens had not been resurfaced for 20 to 30 years and had acquired a faded, dull appearance which masks the true nature of the wood.

The conversion of the air raid shelter adjoining Museum No. 4 to a museum store in place of the much smaller building in the Melon Yard has provided much needed additional space.

In Museum No. 2 repairs to the large skylight, seriously damaged during the war, have been carried out. The table-cases under the skylight, which had become disfigured through leaks, are now being repolished.

Dr. Howes has served on or attended meetings of the Imperial Institute Consultative Committees on Tanning Materials and on Essential Oils, also meetings of the Colonial Primary Products Committee.

The British Pharmacopoeia 1948, published in September by the General Medical Council, acknowledged help given in the preparation of monographs on vegetable drugs. The continued assistance of Dr. R. Melville on the Crude Drugs Committee of the Pharmacopoeia Commission has been requested for the preparation of the next edition of the Pharmacopoeia.

### Jodrell Laboratory

About 100 timber samples, and some 60 other miscellaneous items, were identified after being examined microscopically. A number of enquiries concerning various aspects of plant physiology were also dealt with.

The timbers examined ranged from oak from Somerset for use in the new House of Commons, to obscure or little known woods from South America and tropical Africa respectively. A sub-fossilized wood from Nigeria was identified as being indistinguishable from that of *Chlorophora excelsa* Benth et Hook. f., whilst a fossilized wood from Madeira proved to be indistinguishable from that of *Taxus baccata* L. which was at one time more plentiful on the island than it is now. Charcoals of archaeological interest from Somaliland were all identified as having been prepared from trees and shrubs related to, and possibly identical with, modern woody species that grow in the same region at the present time.

An unusual enquiry related to substitution of sand for the legitimate contents of sacks from Australia. The structure of botanical fragments taken from the sand was of a type that is known to occur in a number of Australian plants, but which is almost or quite unknown in common British species. This suggested that the sand had been substituted for the contents before the sacks left Australia, an opinion which was confirmed when the sand itself was examined by a mineralogist at the Imperial Institute.

Reeds from Iraq, of possible value for making paper, were identified as derived from species of *Typha*, *Phragmites* and *Cyperus* respectively. Roots of trees, suspected of causing damage to the foundations of houses, were identified as those of elm, oak, apple or pear and poplar respectively,



whilst roots clogging an open-jointed pipe carrying a town water supply were found to be those of blackberry (*Rubus* sp.). Amongst the medicinal plants examined, a sample labelled "Indian Senega Root" was found to be derived from a member of the *Acanthaceae*, allied to *Ruellia*.

Towards the end of the year, investigations into the sources, quality and uses of pith were undertaken at the request of the Ministry of Supply, and samples of pith from *Helianthus tuberosus* and *Sambucus nigra* were received for identification.

Enquiries concerning the identification of Mowrah Meal and Cinnamon barks have shown that further research is needed before commercial samples of these items can be identified with precision.

Work on the reference book entitled "The Anatomy of the Dicotyledons", to which reference has been made in previous annual reports, has been continued steadily throughout the year. The typescript of the main work was delivered to the Clarendon Press at the end of January. The introduction was handed over to the Press in the spring. Page proofs have been coming in regularly at weekly intervals since the spring, and nearly 900 pages of first proof and 128 of revised proof have now been corrected. It is estimated that the complete work will comprise some 1,500 pages. Considerable assistance in correcting the proofs has been given by Miss E. M. Slatter, whilst the index is being compiled by Mr. E. Nelmes under the supervision of the authors.

Many new microscope slides have been prepared for the reference collection by Mr. F. Richardson, who has also experimented with the use of polyvinyl alcohol and related chemical substances as a mounting medium for microscope slides.

A card index to literature dealing with the anatomy of the Monocotyledons is in preparation by Miss E. Slatter. This is required in connection with the proposed sequel to the work on the Anatomy of the Dicotyledons.

A start has been made with collecting and fixing material of a wide range of monocotyledonous plants from the Gardens, with the objective of preparing a work dealing with the systematic anatomy of this group. Special attention has been devoted to the *Gramineae*. It is intended that a reference collection of microscope slides shall be built up from this material, in the same way as has been done over a period of years for the Dicotyledons.

## The Gardens

### General

The year 1948, with its rainfall of 22.78 ins. would normally be ranked as one very favourable for the cultivation of plants out of doors at Kew. Unfortunately, the rain did not fall evenly throughout the year and in March and April only 1.73 ins. of rain was recorded, and because of this and the great amount of sunshine Rhododendrons and other evergreens began to suffer. Later in mid-summer heavy rainfall, particularly in August, helped to restore the balance.

During the year numerous applications were received in connection with plant identifications, and technical advice dealing with plant

maintenance, and these constituted the majority of approximately 6,000 letters handled by the Curator's office in the year.

### *Arboretum*

The toll amongst the older trees continues, and seven large Beeches, two Oaks and one Elm had to be removed because of their dangerous condition. Another loss was one of the large old Lebanon Cedars near the Pagoda. The tree had shown signs of ill health for several years and no doubt the dry season of 1947 hastened its end. Fortunately, the milder weather experienced during the winter months of 1947-48 assisted those young trees and shrubs which were planted out to replace losses suffered in the previous hard winter, and gave them the opportunity of becoming well established.

Pride of place among new introductions to the collections must be given to *Metasequoia glyptostroboides*. Several consignments of seed were received during the year, the first in January from the Arnold Arboretum. Some forty young plants have been raised from this seed in pots and they have all made good progress. Two plants have been planted out in the nursery border and to date appear perfectly hardy. The remainder, most of which will be distributed, will be planted out in the early part of 1949.

The later consignments of seed have not germinated very well and from the last lot received from Dr. Cheng in June, not one seedling has yet appeared. The plant roots readily from cuttings which need only be inserted in sandy soil in a warm propagating case. The plant is remarkable in that at intervals its leading shoot appears to stop developing and immediately a secondary leader develops to take its place so that the main axis is sympodial in character.

The general display of flowering trees and shrubs was excellent throughout the year, and Rhododendrons, Magnolias, *Philadelphus*, *Diervillas*, *Clethras* and the various *Rosa* species were particularly good. One or two rare trees and shrubs flowered during the season, in particular *Rehderodendron macrocarpum*, *Paulownia lilicina*, *Oxydendrum arboreum* and *Elliotia racemosa*. Several trees were evidently favoured by the warm dry weather in the early spring and many, which do not regularly produce good seed, this year set large quantities. Amongst these the following were particularly notable :—*Solanum simile*, *Maclura pomifera*, *Dichotomanthes tristanicarpa*, *Halesia diptera*, *Halesia monticola* var. *vestita*, *Liquidambar styraciflua*, *Platycarya strobilacea* and *Sciadopitys verticillata*.

The young Mexican Oaks planted out last year made very satisfactory growth and with the natural protection of surrounding trees, plus artificial protection with various materials, it is hoped that these very distinct Oaks will become established. The work of contouring to the north-east of the Azalea Garden, was completed and the area seeded down, and this section of the Gardens is now greatly improved. Thousands of bulbs have been planted on the mounds, and it is hoped that in spring this will become one of the most pleasant areas.

Land is still set aside for the cultivation of vegetables, and though little was done in the way of experiment, the general yield from the crops was very satisfactory.



During the year large quantities of surplus trees and shrubs have been distributed to Government Departments, Botanic Gardens and other scientific institutions while the demand for seeds collected during the previous year was exceptionally heavy. In all 4,861 packets of seed were distributed in this way. Many new introductions occurred during the year, the most noteworthy being *Viburnum bodnantense*, *Cercis griffithii*, *Magnolia ashei*, *Clematis addisoni*, *Embothrium coccineum* (Elliott's Form) and also the new American *Syringa*, Clarke's Giant.

#### *Alpine and Herbaceous Department*

The reconstruction of certain parts of the Rock Garden was continued, and in autumn the area devoted to the cultivation of Sedums and Sempervivums was entirely rebuilt. Sussex sandstone was used for the purpose in order to conform to the rest of the stone in that area. Another section of the Rock Garden surrounding one of the streams was remade. It is devoted chiefly to the growing of moisture-loving plants, and had become badly infested with the common *Convolvulus*. The soil was also exhausted and it was, therefore, removed to a depth of eighteen inches and fresh loam added. Most of the plants quickly recovered from the transplanting.

In its season, the Iris Garden is always beautiful, but this year so fine was the display and so prolonged the period of flowering that it received greater admiration than usual. After flowering, overcrowded plants were taken out, the rhizomes divided and the beds top dressed with new soil. A number of new varieties were also included and a few of the older and poorer forms discarded.

In early spring the alpine house again provided a continuous show of flower until well on into mid-summer. Large pans of bulbous plants comprising *Hyacinthus*, *Crocus*, *Narcissus* and *Scillas* gave a colourful display, followed later by choice and uncommon plants such as *Lewisia tweedyi*, *Saxifraga cotyledon* and others.

The weather suited the Rock Garden plants and the very cool damp summer which followed tended to prolong the length of the flowering season. All moisture-loving plants did well and made good growth though at the same time many annuals and biennials which require a considerable amount of heat and sunshine during the summer, failed to reach maturity. Particularly noticeable in this respect were plants in the families *Solanaceae*, *Portulacaceae* and *Scrophulariaceae*.

Many valuable collections were donated during the year including a large collection of *Pentstemon* species gathered in Utah, New Mexico and Arizona, by Dr. Worth, seeds collected by Joseph Rock in West Yunnan and Tibet, a large and varied collection of seeds gathered in South East Tibet by Captain Sherriff and Mr. Ludlow. The John Innes Horticultural Institution contributed a fine lot of uncommon *Tulip* species, whilst both Helsinki and Edinburgh Botanic Gardens sent in living material of many uncommon plants. Seeds and bulbs were also received from Dr. Rechinger who made an expedition to Persia. The fine weather earlier in the year contributed to the flowering of many plants and amongst these was *Primula prolifera* which flowered for the first time at Kew. The seed of this plant was collected and sent in by

Dr. Bor from the Khasia Hills. *Cytisus battandieri*, a native of Morocco, flowered particularly freely and *Lilium Parryi*, a rather difficult plant to grow at Kew, also flowered well. Amongst others worthy of special mention are *Genista lydia*, *Rheum alexandrae* and *Cistus salvifolius* var. *prostratus*.

### *Use and distribution of material*

During the year a considerable quantity of living plant material has been supplied by the department for scientific research work, whilst in view of the great demand for the seeds available, over 8,000 packets were despatched to various botanic gardens and other horticultural institutions throughout the world.

### *Decorative Department*

The bedding displays in early spring were the poorest we have experienced for many years. Considerable damage was caused by disease to the Tulips growing in the Palm House Front beds and also in the Broad Walk.

Reconstruction of the department was begun in October when drastic alterations were made to the potting shed which, for many years, has been so unsatisfactory. New storage racks were installed for Dahlias, the potting benches were replaced and a small office created for the Foreman of the department. The whole of the timbered ceiling has been painted white with the result that today working conditions have been greatly improved.

The fruit and vegetable demonstration plots were maintained by the department, and after the retirement of Miss Irene Sanders through ill health, Miss Jean Sharps acted as demonstrator.

Special mention must be made of the very long display exhibited in the Rose Garden, the flowering season beginning towards the end of May and good displays of bloom were afterwards found right through to October.

### *Tropical Department*

#### *Palm House*

Re-soiling of the permanent beds is an operation which cannot be neglected and two of these were re-soiled during the year. Several of the large plants were re-arranged and a few new ones planted where necessary. The additional sunshine of the previous year was no doubt responsible for the number of very large Palms which flowered so profusely. Amongst these were *Livistona subglobosa*, *Livistona australis*, *Caryota urens* and *Phoenix humilis* var. *roebelinii*. Two or three very fine cones were produced during the year on *Encephalartos latifrons* and *E. villosus*. In House No. 15 *Nymphaea gigantea* var. *alba* gave a wonderful display during the summer months, this plant having been received from Mr. George Pring, Missouri Botanic Gardens.

#### *T. Range*

The collection of Orchids has increased and also improved greatly during the last three years and many are flowering better than they have done previously. New concrete benches have been installed in the Orchid show houses 13A and 13B.



The Stove collection of plants has also been added to from time to time and possibly today ranks as the best collection of its kind in Europe.

At the request of the Royal Horticultural Society, the Gardens contributed an exhibit at Chelsea Flower Show. This comprised a mixed collection of stove and greenhouse plants of many types and once again the exhibit was awarded the highest award possible, viz., a Gold Medal.

### *Fereries*

Early in the year we were fortunate in having presented to the Gardens the magnificent collection of filmy ferns built up by the late Mr. C. W. Adkin and presented to the gardens by the generosity of his son. In order to house these properly it was necessary to make large alterations to the existing house and the sliding lights, staging and hot water pipes were all removed in order to give adequate room for appropriate display. Stones were introduced and built up to a height of some 4 ft. The inner and outer roofs were re-glazed with special roll glass which ensures the subdued light so necessary for the cultivation of this type of fern.

### *House No. 15*

The wooden sill along both sides of this house became badly decayed during the war years and this has been replaced with a new concrete sill, whilst many of the side lights were repaired and re-painted.

### *Boilers*

An army of men have been employed in renovation and replacement of boilers. During the summer the following boilers were acid-cleaned :—two T. Range, six Palm House, one No. 15, six Melon Yard. In the Palm House stoke-hole a new sectional boiler was installed in place of the old saddle boiler and a new flue fixed and connected to the back of the existing boilers.

A great improvement has been brought about by the introduction of electric light to No. 15 stoke-hole and the Fereries stoke-hole and potting shed.

Many valuable introductions to the department took place throughout the year, including more particularly Orchids from Mr. C. H. Lankester of Costa Rica and Messrs. M. Fitzpatrick J. A. Hood, Major R. T. Blayney, H. Callens, Belgian Congo and F. Wyatt, and of particular interest a new species collected by an old Kewite, Mr. E. A. Braybon, near the Victoria Falls.

The collection of succulent plants was also added to considerably by contributions received from Stellenbosch Botanic Gardens, Hamburg Botanic Gardens and Messrs. Bally, R. W. J. Keay, J. P. M. Brennan, Monsieur André Bertrand, G. G. Smith.

Amongst aquatics the main additions of note were the tubers of tropical *Nymphaeas* received from Mr. G. H. Pring, Missouri Botanic Garden, and many forms of aquatic plants from Mr. A. Fraser Brunner.

### *Temperate Department.*

There has been a wonderful succession of flower in the Temperate House throughout the year and from early January the various forms of *Camellia sasanqua* and many garden forms of *C. japonica* continued to

bloom from then until well after mid-summer. The new Chinese species, *Camellia taliensis*, now having reached a height of 6 ft. commenced to flower in January, the blooms being of a pure white with a cluster of golden yellow anthers. A very old specimen of *Camellia reticulata* which is now nearly a centenarian, continues in good condition, and each year it flowers freely, making a great attraction in this house.

Another species not previously cultivated at Kew was *Camellia salicifolia*, a dwarf twiggy type of shrub which flowered freely on quite small plants in the Temperate House Pits. The flowers are borne in the axils of the upper leaves, are white and last a very few days.

The collections of *Acacias* flowered more freely than ever before and there is no doubt that the additional sunshine of 1947 helped them greatly in setting their flowering buds. Several species of *Eugenia* received from the Botanic Gardens, Sydney in 1927 have now made excellent specimens. They are very valuable for their evergreen foliage and highly decorative fruits, which range in colour from violet to rosy-red.

*Rhododendrons* have once again been prominent when in bloom and the season has now been lengthened by the August flowering species, *R. Kyawi*, a native of Burma. This will no doubt be used for breeding late flowering forms in future. The Blue *Jacaranda* is rarely seen in flower in British gardens but of recent years in the Temperate Department, a number of young plants in pots have flowered profusely and even isolated plants fruit freely.

Cultural conditions are not ideal in this house at the present time as the constant drip from the roof in wet weather leads to sodden soil and poor aeration. In addition breakdowns to the heating system during the winter months caused very low temperatures and the resultant loss of many plants. It was, therefore, decided to renew the whole of the boilers during the summer months, and eight new White Rose sectional boilers were installed in place of the small Robin Hood type. It should therefore, be possible in future to maintain a higher temperature during exceedingly cold weather without undue forcing of the heating system.

The opportunity was taken at the same time of using two of the best Robin Hood boilers for re-assembling at the stoke-hole in the Temperate House Pits, and at the same time of introducing electric light both here and into the potting shed.

### *Botanical Magazine*

The following plants grown in the Gardens were figured in the *Botanical Magazine* during the year :—*Amorphophallus abyssinicus*, *Pyracantha koidzumii*, *Prostanthera cuneata*, *Salix medemii*, *Centaurea hypoleuca*, *Philageria veitchii*, *Hippeastrum carnarvonii*, *Crocus ancyrensis*, *Fritillaria "Roddeana"*. The list is not as large as usual and it is hoped to improve on this in future years.

### **Economic Botanist**

Sir Geoffrey Evans returned from the Caribbean area in January 1948, but was kept engaged in the preparation of the Report of the British Guiana and British Honduras Settlement Commission, of which he was Chairman, for some time. The report was completed and sub-



mitted to the Secretary of State for the Colonies in June 1948, and was published as a White Paper (Cmd. 7533) early in October. Subsequent to the submission of this Report, a good deal of discussion and correspondence has taken place in connection with the specific recommendations contained in the Report.

In addition to this work, he was also a member of several other Government or quasi government Committees. In November he was appointed a member of the Colonial Advisory Council for Agriculture, Forestry and Animal Health, and continued to act on the Cocoa Research and the Agricultural Committee of the Council. He continued as Chairman of the Anti Locust Research Committee.

Among other duties he was a member of the Scientific Committee of the Empire Cotton Growing Corporation, and was a Governor of the Imperial College of Tropical Agriculture sitting on the Finance and Academic Committees. He also represented Kew on the Consultative Council for Vegetable Fibres.

He continued to be Chairman of the National Pinetum (Bedgebury) Committee which is composed of representatives from the Forestry Commission and from Kew. He also represented the Director on the Committee of the *News of the World* Gardens Show which is to be held at Olympia in July next, and proffered advice about the growing of tropical products for this Exhibition. As before, he sat on the Scientific and Fuel Committees of the Royal Horticultural Society.

Renewed interest is now being shown by different Colonies in the interchange and import of certain tropical products, mainly in connection with the breeding of new races for resistance to specific diseases. In particular, cocoa, bananas, fibre plants and sugar cane were handled, and correspondence about tropical products dealt with as usual.

### Publications

Three parts of the Kew Bulletin have been published as the volume for 1948.

The Botanical Magazine, edited by Dr. Turrill for the Royal Horticultural Society, commenced a New Series. The four parts of volume 1 (new series) have been issued with the full complement of a total of 44 single and 4 double plates with accompanying text during 1948. The articles of the text were mostly provided by members of the Kew staff, in their private time, but are not enumerated separately in the following list of publications :—

Sir Edward Salisbury : The Span of Life. Proc. Roy. Soc. Medicine, **40**, 638–641 (1947).

The Royal Botanic Gardens, Kew. Proc. Roy. Soc. B. **135**, 419–429 (1948).

The Flowers of Spring. Proc. Roy. Institution, 1–7 (1948).

The Balance of Nature. First Principles in Conserving Wild Life.

The Times. 28th December, 1948.

N. L. Bor : A new species of *Deyeuxia* from Persia. Kew Bull. **1948**, 42 (1948). Dr. Stocks' *Sporobolus* from Sind. l.c., 45. New Species

- of *Poa* from India, Burma and Tibet. l.c., 138-144. *Narenga fallax* (Balansa) Bor. l.c., 162.  
Ecology—Forestry's fundamental Science. Empire Forestry Review **27**, 116-120 (1948).
- W. B. Turrill : British Plant Life. Collins, London, 1948, pp. 315.
- E. M. Marsden-Jones and W. B. Turrill : Researches on *Silene maritima* and *S. vulgaris* : XXVII Kew Bull. **1948** : 29-33 ; XXVIII, l.c., 33-42 ; XXIX, l.c., 253-263 ; XXX, l.c., 264-276.
- E. M. Wakefield : Taxonomic Problems in *Hymenomycetes*. Trans. Brit. Mycol. Soc. **30**, 152-160 (1948).
- V. S. Summerhayes : African Orchids XVII, Kew Bull. **1947**, 123-133 (1948) ; *Pomatocalpa ramosum* Summerh. l.c., 56 ; African Orchids XVIII, l.c., 277-302.
- F. Ballard : Further Notes on *Onocleopsis*, Amer. Fern Journ. **38**, 125-132 (1948).
- N. Y. Sandwith : The Glabrous White Campion. The Naturalist, **1948**, 45-46.  
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*Bignoniaceae* and *Ebenaceae* of B. Maguire's 1944 collection in British Guiana, Bull. Torrey Club, **35**, 654, 662-667 (1948).
- C. E. Hubbard : Keys to the tribes, genera and species of grasses in Riddelsdell, Hedley and Price, Flora of Gloucestershire, pp. 530-588 : 1948.  
Classification of the genera of British Grasses in Hutchinson, British Flowering Plants, pp. 284-348 : 1948.
- E. Milne-Redhead : *Ferdinandia* Welw. ex Seem. [*Bignoniaceae*], an unintentional orthographic error. Kew Bull. **1948**, 170 (1948).
- F. N. Howes : Nuts, their Production and Everyday Uses. pp. 264. (Faber and Faber Ltd., London).  
Logwood and Writing Ink. Kew Bull. **1948**, 248-251 (1948).  
Vegetable Sources of Edible Oils. Research **1**, 678-684.  
Groundnuts. Agriculture **55**, 25-29.
- C. R. Metcalfe : Lesser Rubber Plants. Research **1**, 10, 438-446 (1948).  
The Elder Tree (*Sambucus nigra* L.). Kew Bull. **1948**, 163-169 (1948).
- H. K. Airy Shaw : The Vegetation of Angola. Journ. Ecol. **35**, 24-48 (1947).  
Studies in the Ericales : V. Further notes on *Agapetes*. Kew Bull. **1948**, 77-104, figs. 1-4 (1948). Studies in the Ericales : VI. Further notes on *Gaultheria dumicola* W. W. Sm. l.c., 109-110.  
Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew : XX. Summary of Supps. I-XIX : Miscellaneous records, 1945-46, l.c., 113-124.  
Studies in the Ericales : VII. Illustrations of four scarce Asiatic *Gaultherias*. l.c., 158-161, figs. 1-4. Studies in the Ericales : VIII. A new section of *Vaccinium* from the Eastern Himalayas.



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- Directory of Natural History Societies. Amateur Entomologists' Society, Pamphlet no. 7 (1948).
- Floristic and nomenclatural notes, in Riddelsdell, Hedley and Price, Flora of Gloucestershire (1948).
- R. Melville : The British Elms. New Naturalist, 1948, 36.
- R. Melville with J. Hutchinson : The Story of Plants and their Uses to Man. pp. 334 (Gawthorn, London), 1948.
- R. W. G. Dennis : Some little known British Species of *Agaricaceae* : I. *Leucosporae* and *Rhodosporae*. Trans. Brit. Mycol. Soc. **31**, 191-209, 1948.
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- R. W. G. Dennis and N. Y. Sandwith : *Aecidia* of Barley Rust in Britain. Nature CLXII, 461, 1948.
- A. A. Bullock : *Printzia polifolia*. Kew Bull. **1948**, 54-55, t. 2. *Ampelocissus kirkiana* l.c., 187-188.
- B. L. Burtt : *Kochia odontoptera* and *K. iranica* Kew Bull. **1948**, 43-45 (1948). *Farsetia socotrana* l.c., 168.
- A note on *Paraboea*. l.c., 55-56. *Didelta* and *Cuspidia*. l.c., 69-73.
- The correct names of the Australian Bluebell Creepers. l.c., 74-76.
- New species of *Nototriche*. l.c., 125-137.
- Crocus kotschyanus* var. *leucopharynx*. Gard. Chron. 3 ser. **124** : 118-119. *Crocus niveus*. Gard. Chron. 3 ser. **124** : 134-135.
- J. P. M. Brenan : A new species of *Diospyros*, in Kew Bull. **1948**, 111 (1948). [with H. L. Dunkley]. *Platypteroctarpus*, a new Tree Genus of *Celastraceae* from Tanganyika, l.c., 47-50.
- E. Nelmes : Notes on *Carex* XVI. New Chinese *Carices*. Kew Bull. **1948**, 107-110 (1948).
- Notes on British *Carices*, VII. *Carex leporina* L. (Bot. Soc. Exch. Club, Rep. 1946-47, 334-337 [1948].
- Key to the *Carices* of Gloucestershire (and taxonomic and nomenclatural notes on some of the species) in (Flora of Gloucestershire, by Riddelsdell, Hedley and Price, pp. 501-506, 523, 525-526, 613).
- C. I. Dickinson : Some misplaced *Cyanophyceae*, Kew Bull. **1948**, p. 168 (1948).
- R. A. Blakelock : *Euonymus frigidus* Wall. and its allies. Kew Bull. **1948**, 237-244 (1948).
- A. D. Cotton and R. A. Blakelock : An arborescent *Senecio* from Mt. Meru : *S. meruensis* sp. nov. Kew Bull. **1947**, 135 (1948).
- D. Chatterjee : New plants from India and Burma. Kew Bull. **1948**, 57-65. *Amphicome*—a superfluous genus of *Bignoniaceae*. l.c., 183-185.

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National Herbarium for India. Science and Culture **13** : 328-330 (1948). Correct name of *Herpestis monniera* H. B. K. l.c., **14** : 156-157 (1948). Affinities of *Moringaceae*. l.c., **14** : 253-4 (1948).

H. S. Marshall : The Royal Botanic Gardens, Kew. Herbarist no. **14** : 8-12 (1948).

E. M. Slatter : The Wood Structure of *Senecio meruensis* Cotton and Blakelock. Kew Bull. **1948**, 51-53 (1948).

### Dr. John Hutchinson F.R.S.

The retirement of Dr. John Hutchinson F.R.S. from the post of Keeper of Museums took place on the 31st May 1948 after 44 years service at Kew. Dr. Hutchinson's early life was spent in handling and working with living plants in various horticultural establishments. He started his Kew career on the outdoor or Garden Staff in 1904. His gifts as a promising young botanical artist had already attracted attention when he was transferred to the Herbarium. Here he was engaged in systematic and taxonomic work under Dr. Otto Stapf F.R.S. with whom he worked in the closest harmony for many years, being Assistant for India at one time and later in charge of the African Department. He was responsible for some of the difficult groups (*Euphorbiaceae*, *Moraceae*, etc.) in the *Flora of Tropical Africa* and later, in collaboration with the late Dr. J. M. Dalziel, for the whole of the *Flora of West Tropical Africa*. Dr. Hutchinson's knowledge of African plants was strengthened by his visit to tropical West Africa and he also made two extended botanical tours in southern Africa. The results of the latter were described in his attractive book *A Botanist in South Africa*. He received the honorary degree of LL.D. from the University of Aberdeen and was appointed Keeper of Museums at Kew in 1936.

Hutchinson's most important contributions to botanical science are in the field of plant classification. His *Families of Flowering Plants* (2 vols.) has become a standard work. A volume devoted to the classification of the British Flora (*British Flowering Plants*) has recently appeared. In the horticultural field his special interest for many years was the genus *Rhododendron* and later the genus *Sorbus*. He received several horticultural honours, including the Victoria Medal of Honour of the Royal Horticultural Society. For his services to botany in general and to taxonomy in particular, Dr. Hutchinson was elected a Fellow of the Royal Society in 1947.

In his retirement Dr. Hutchinson hopes to complete a revision of Bentham and Hooker's *Genera Plantarum* and also some botanical works of a more popular kind. The good wishes of his colleagues at Kew go with him.



**ROYAL BOTANIC GARDENS, KEW**  
**LIST OF STAFFS**

31st December, 1948

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*Director*

Sir Edward J. Salisbury, C.B.E., D.Sc., Sec.R.S., F.L.S.

*Assistant Director*

N. L. Bor, C.I.E., M.A., D.Sc., F.L.S.

*Economic Botanist*

Sir Geoffrey Evans, C.I.E., M.A., Dip. Agric.

HEAD OFFICE

Staff Officer—F. G. Solomon

Clerks—H. R. Middlemost  
 Mrs. M. L. Pelaez

Shorthand Typist—Mrs. A. M. E. Kendall

HERBARIUM AND LIBRARY

Keeper (S.P.S.O.)—W. B. Turrill, D.Sc., F.L.S.

Deputy Keeper (P.S.O.)—Miss E. M. Wakefield, M.A., F.L.S.

Principal Scientific Officers—V. S. Summerhayes, B.Sc.

F. Ballard, B.Sc.

N. Y. Sandwith, M.A., F.L.S., F.R.G.S.

C. E. Hubbard, F.L.S.

E. Milne-Redhead, M.A., F.L.S.

H. K. Airy Shaw, B.A., F.L.S., F.R.E.S.

Senior Scientific Officers— A. A. Bullock, B.Sc., F.L.S.  
 R. W. G. Dennis, B.Sc., Ph. D.  
 B. L. Burtt, B.Sc., F.L.S.  
 J. R. Sealy, B.Sc., F.L.S.  
 J. P. M. Brenan, M.A.

Scientific Officer— R. D. Meikle, B.A., LL.B.

Experimental Officers— Miss C. I. Dickinson, M.A., Dip. Agric.  
 E. Nelves, F.L.S.  
 R. A. Blakelock, B.Sc., F.L.S.

Assistant Experimental

Officers—Miss P. Lewis, B.Sc., F.L.S.  
 J. Kennedy O'Byrne  
 P. Taylor

Senior Assistant (Sci.)— (Index Kewensis)	Miss M. I. Skan
Assistant—	W. V. D. Pieris (Bentham-Moxon)
Assistants (Sci.)—	Miss B. Bates Miss I. Blewett Miss P. Halliday Miss D. Newton A. L. G. Sapper F. C. Woodgate
Visiting Botanists—	D. Chatterjee, M.Sc., Ph.D., F.L.S. (India) Miss P. Kies, M.Sc. (South Africa)
Librarian—	H. S. Marshall, F.L.S.
Clerical Officer (Library)—	C. E. A. Hutchings
Librarian Assistant—	Miss M. C. Davey (Bentham-Moxon)
Hon. Associate (Transplant & Breeding Experiments)—	E. M. Marsden-Jones, F.L.S., F.R.E.S.
Artists—	G. Atkinson Miss Stella Ross-Craig, F.L.S. (Bentham-Moxon)
Mounters (Supervisor)—	Miss J. Forster
Mounters—	Mrs. V. A. Feddern Miss B. M. Ballard Miss I. E. Farrow Miss N. V. Williams
Clerical Officers—	Miss D. King Miss E. Mates
Typists—	Miss M. Kierans Miss M. Sillitoe

#### JODRELL LABORATORY

Keeper (P.S.O.)—	C. R. Metcalfe, M.A., Ph.D., F.L.S.
Assistant Experimental Officer—	Miss E. M. Slatter, B.Sc.
Senior Assistant (Scientific)—	F. Richardson

#### MUSEUMS

Keeper (P.S.O.)—	F. N. Howes, D.Sc.
Senior Scientific Officer—	R. Melville, B.Sc., Ph.D., F.L.S.
Scientific Officer—	Vacant.
Typist—	Miss B. J. Saunders
Preparer—	L. J. Harding



## GARDENS

Curator—	W. M. Campbell, N.D.H., F.Inst.P.A.
Assistant Curators—	L. Stenning (Tropical) S. A. Pearce, F.Inst.P.A. (Arboretum) C. P. Raffill, M.B.E., V.M.H., A.H.R.H.S. (Temperate) G. H. Preston (Herbaceous) S. W. Rawlings (Greenhouse & Ornamental)
Foremen Gardeners—	L. R. Brown (Herbaceous and Rock Garden) B. L. Perkins (Orchids—Tropical) H. Bruty (Ferneries—Tropical) W. S. Smith (Decorative—Greenhouse and Ornamental) W. Bridle (Temperate) G. C. W. Gardner (Arboretum) J. Souster, N.D.H. (Arboretum)
Higher Grade Clerk—	E. G. Dunk
Clerks—	Miss D. A. Wheeler Mrs. L. A. Kell R. J. Claiden C. F. Norman
Shorthand Typist	Miss P. E. Bowman
Typist—	Miss V. Lancaster

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CONSTABULARY

Sergeant in Charge—	G. E. Williams
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### **Laurentia in the Balkan Peninsula.**

Two species of *Laurentia* are generally accepted as occurring in the Mediterranean Region. *L. gasparrinii* (Tin.) Strobl. is an annual and specimens have been seen from southern Portugal, southern Spain, the Balearic Islands, southern France, Corsica, Sardinia, Italy, Sicily, Leucas (Ionian Islands), Morocco, and Algeria. *L. tenella* (Biv.) DC., a perennial, is represented at Kew by material from the Balearic Islands, Corsica, Sardinia, Sicily, Crete, Euboea, and Cyprus. The known ranges of the two species in the Balkan Peninsula are of interest since they are restricted and do not overlap. *L. gasparrinii* is known only from the Ionian Islands. Halácsy, Consp. Fl. Graec. Suppl. **1**, 72 (1908) records the species: "In humidis Corcyrae (Mazziari): inter Val Triclino et Val di Ropa (Bicknell)." In the Herbarium at Kew there are specimens from "Leucadiae", presumably the island Santa Maura which is also known as Leucas or Levkas. *L. tenella* is common in Crete whence it is recorded from many localities (see Halácsy, Consp. Fl. Graec. **2**, 281: 1902, Suppl. **1**, 72: 1908 and Rechinger Fl. Aegaea 606: 1943 and Neue Beiträge zur Flora von Kreta, in Denk. Akad. Wiss. Wien Math.—Nat. Kl. **105**, 2, 138: 1943). It is also stated by Halácsy (l.c.) to occur in Corfu (Corcyra) and, as *Lobelia tenella* [Consp. Fl. Graec. Suppl. **2**, (171) 61: 1912] in "Elis: silva Manolada (Maire)". The last record has not been found in the publications of Maire and Maire et Petitmengin. There has recently been received at Kew a specimen of *L. tenella* collected on the Ochi (Okhi) mountains, Euboea (Evvoia), by Dr. C. N. Goulimy. The summit of Ochi is given as 4563 ft. (1491 m.) and the peak and ridge extending towards Cape Kafirévs are said to be formed of specially hard schist. It is interesting to have this extension of range of *L. tenella* in the Aegean area and it suggests the possibility of the occurrence of the species in Asia Minor.

Rechinger (l.c.) uses the name *Laurentia minuta* (L.) DC. in place of *L. tenella*. The combinations *Laurentia minuta* and *L. tenella* were both published in DC. Prodr. **7**: 410 (1839) as names for different species. The former is based on *Lobelia minuta* L. Mant. altera, 292 (1771) for which the statement is made "*Habitat in Cap. b. spei subaquosis*". The description, so far as it gives diagnostic characters, would fit *L. tenella* as now generally accepted. E. Wimmer (in Ann. Naturhist. Mus. Wien **56**, 333: 1948) has a discussion under the name *Laurentia minuta* (L.) A. DC. em E. Wimm. and explains that Linnaeus's description leaves scarcely a doubt that the species Linnaeus intended is the Mediterranean one and that the reference to South Africa is a mistake. In the Linnean Herbarium at the Linnean Society of London there is a sheet written up in Linnaeus's handwriting "*Lobelia minuta*". This has been crossed out and "*Erica*" written in place of it. The material may well be a species of *Erica*: it certainly has nothing to do with *Lobelia* or *Laurentia* and does not agree with the original description of *Lobelia minuta*. In view of the doubt that remains regarding the plant Linnaeus described the name *Laurentia tenella* is retained for the time being. Wimmer (l.c.) describes two forms: f. *nobilis* from near Palermo and from Cyprus and f. *balearica* from the Balearic Islands.—W. B. Turrill.



## CLASSIFICATION OF THE BANANAS

E. E. CHEESMAN

Imperial College of Tropical Agriculture, Trinidad, B.W.I.

## III. Critical Notes on Species\*

g. **M. itinerans** Cheesman, sp. nov. Planta alta, stolonifera, rhizomatis longissimis, inflorescentia pendula, pedunculo puberulente, bracteis purpureis convolutis multifloris, floribus albidis, fructibus longissime pedicellatis in pedicellam sensim attenuatis, seminibus tuberculatis irregulariter angulosis depressis.

This species is a relatively recent accession to the I.C.T.A. collection. Introduction nos. 184 and 185 were two packets of seeds received in August 1938 from C. W. D. Kermode Esq., Silviculturist, Burma. The seeds were collected "from evergreen forest at Tagwin, Myitkyina, Upper Burma" and called *Hpu-gyaing-nget-pyaw*. No. 184 was labelled "small kind" and No. 185 "large kind", but they gave indistinguishable progenies which we allowed to mix under the temporary label "Tagwin 4". The plant is clearly referable to *Musa* § *Eumusa*, yet very distinct from any species of that section hitherto described. It has been collected before, though not named. C. E. Parkinson collected several *Musa* spp. in the Myitkyina District in 1928, and Parkinson 1761 in Herb. Kew. is doubtless the same species as here described.

*M. itinerans* is named from its habit of "travelling" from the spot where it is planted, by means of its long rhizomes. It has otherwise the vegetative habit and stature of a cultivated banana, and there is nothing remarkable in its flowers or seeds. In male bud and fruit it is so unlike any described species that none can be mentioned as its possible nearest relative. Its relationship to other members of *Eumusa* will have to be determined cytogenetically rather than on phenotype. A full description in English follows:

Plant stooling freely and developing long rhizomes which turn up 2 metres and more away from the parent stem; pseudostems attaining 4 m. or more in height, 20-25 cm. in diameter at base, green with varying development of reddish-brown or blackish pigmentation according to age and exposure; leaf-sheaths and petioles devoid of wax.

Leaf-blades up to 3 m. long, 60 cm. wide, truncate at apex, rounded at base; petioles 30-50 cm. long, their margins narrow, membranous and erect above, closely clasping the pseudostem at base and very early becoming scarious.

Inflorescence semi-pendulous; peduncle velvety with a dense minute puberulence; basal 2-4 (-6) "hands" female, upper hands male.

Bract subtending female flowers ovate-lanceolate, about 30 cm. long × 6 cm. broad at base, 13 cm. broad at centre, the apex of the lower bracts obtuse and very slightly foliaceous; pale yellow and shining within, dark purple at base without, green streaked with purple towards the apex.

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\*Continued from K.B. 1948, p. 328.

Female flowers in the lower bracts about 14, in two rows ; compound tepal 4–5 cm. long, pale yellow, its lobes up to 11 mm. long, with dorsal appendages 2–3 mm. ; free tepal about half as long as the compound tepal, translucent, boat-shaped, about 6 mm. deep and 5 mm. broad, rounded at the back, smooth, the apex truncate-mucronate, staminodes 5, longer than the free tepal, about 3 cm. long  $\times$  3.5 mm. broad, flattened, linear, white, fleshy, the apex pale yellow-orange and acute or acuminate ; style slightly shorter than the compound tepal, creamy-white, 2–3 mm. thick ; stigma capitate, greyish-brown, about 6 mm. broad and deep, dorsiventrally compressed ; ovary pale green, markedly 3–5-angled, 7–8 cm. long including the constricted apex (5 mm.) and whitish pedicel (about 2 cm.) into which it narrows at the base ; loculi 3, ovules about 160 per loculus, scattered rather than disposed in regular rows.

Male bud in advanced blooming rather narrowly ellipsoidal, the bracts convolute at the tip. Bracts dark reddish purple outside, commonly with a yellow margin and often variegated with longitudinal stripes of yellow, yellow inside, paling to almost white at the base.

Male flowers 12–16 per bract in two rows, 6–8 cm. long over-all ; compound tepal whitish, its lobes about 5 mm. long ; free tepal less than half as long as the compound, boat-shaped, with a minute apicula, stamens as long as the compound tepal, at length slightly exerted.

Fruit bunch rather lax, the “fingers” spreading and not exhibiting a very strong geotropic curvature. Individual fruit about 10 cm. long, 3 cm. in diameter, oblong-turbinate or obovoid, that is, widest near the apex and narrowing gradually into a long (5 cm.) pedicel from which it is not sharply distinct, obscurely 5-angled at maturity, very abruptly narrowed at the apex to a short (5 mm.) truncate acumen ; pericarp pale whitish green on the immature fruit, yellow at full ripeness, 2 mm. thick ; pulp pale cream colour.

Seeds tuberculate, irregularly angulate-depressed, 5–7 mm. across and 3 mm. high.

*Habitat* : In evergreen forest at Tagwin, Myitkyina District, Upper Burma. Described from plants in cultivation at the Imperial College of Tropical Agriculture, Trinidad, B.W.I.

## CLASSIFICATION OF THE BANANAS

E. E. CHEESMAN

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### III. Critical Notes on Species

h. ***Musa ornata* Roxb.** *Hort. Beng.* 19 (1814) *et Fl. Ind.* 2. 488 (1824).

This species is widely distributed in cultivation in the tropics as an ornamental plant, and therefore one of the best known species of *Musa*, certainly the best known in the section *Rhodochlamys*, though frequently misnamed. It is listed in Roxburgh's *Hortus Bengalensis* by name only,





Fig. 1.



Fig. 2.

*M. itinerans* sp. nov.

Fig. 1. Male bud in advanced blooming.

Fig. 2. Fruit bunch approaching maturity.

*Scales in inches.*

*Photographs by K. S. Dodds.*

[To face page 24



Fig. 1.



Fig. 2.

*M. ornata* Roxb.

Fig. 1. Male bud.  
Fig. 2. Fruit bunch.  
Scales in inches.

Photographs by K. S. Dodds.



and the original description occurs in his *Flora Indica* edited by William Carey and published in 1824. As there has never been any serious question about the identity of the plant, the description need not be reproduced here.

Undisputed identification, however, has not prevented confusion in nomenclature. There is appended to the description a footnote by Nathaniel Wallich : " This is probably *M. rosacea* Jacq. which has been well figured in Botan. Regist. 9 : 706 A and B.—N.W." The plate in the *Botanical Register* (1823) to which Wallich referred, and another (t. 615) in Loddiges *Cabinet* (1822), originated a mistake that has maintained a surprising currency right down to some of the most recent authors. The plant depicted is certainly *M. ornata* Roxb., but the name *M. rosacea* Jacq. belongs to an entirely different plant and should never have been attached to Roxburgh's species.

The person responsible admitted : " There is some difference in the representation of this plant in Jacquin's work from the one before us, but we really believe the apparent difference arises principally from the upper portion of Jacquin's plant being withered before opening. An accident prevented our being able to examine the subject so accurately as we wished". This shows that the writer had at least looked at Jacquin's drawing and made an honest error, but later authors who have coupled together *M. rosacea* and *M. ornata* as synonyms can scarcely have done as much, for indeed the two are about as different as any two species of *Musa* can be.

*M. rosacea* Jacq. Hort. Schoenb. 4 : 22, t. 445 (1804) et Fragm. t. 132 fig. 4 (1808) was an edible banana, referable either to *M. balbisiana* Colla or to *M. sapientum* L. and I think more probably the latter. According to Jacquin, it was taken from Mauritius to Europe by Boos in 1788, and flowered at Schonbrunn where he described it. Its Mauritian provenance no doubt contributed to the later error, because the plant depicted in the *Botanical Register* is noted as " introduced from the Mauritius by Sir Joseph Banks in 1805".

I have been unable to check all the illustrations listed in *Index Londinensis* under *M. rosacea* Jacq. to see how many are really of Jacquin's plant, but I doubt if any are, except the two original figures cited above, so widespread has the error become.

Unless there were two ornamental species of *Musa* introduced from Mauritius to Europe in 1805, there has been further confusion with *M. rosea* Baker. I know nothing of this species except Baker's description (in *Ann. Bot.* 7 : 221. 1893) which runs as follows :

*M. rosea*, Herb. Bot. Calcutt. Habit of *M. coccinea*, but leaves much shorter and broader in proportion to length, thin, green, about a foot long by half as broad, deltoid at the base and apex ; petiole deeply channelled, nearly as long as the blade. Panicle short, erect ; rachis pubescent, not flexuose ; bracts pale red ; lower lanceolate, half a foot long ; upper oblong, obtuse, about 2 in. long ; flowers 2-3 in a cluster. Calyx an inch long ; petal as long as the calyx. Fruit and seeds not seen. Described from two specimens in the Calcutta Herbarium, dried from the Botanic Garden in June 1882.

De Wildeman (*Ann. Mus. Col. Marseille* ser. 2, 10 (1912) p. 353) says of *Musa rosea*: " Cette espèce est décrite d'après des documents contenus dans l'Herbier de Calcutta. Elle est une des plus anciennement connues dans les Jardins de L'Europe. Elle a été introduite en Europe vers 1805, en provenance de l'île Maurice". That there was a species known in Europe as *M. rosea* long before 1893 is proved by the citation in *Index Londinensis* of three illustrations published over the name in 1841, 1842 and 1849 respectively. I have not been able to refer to these illustrations to satisfy myself whether they represent Baker's plant, *M. ornata*, or a third entity, but it seems to me likely that they may on examination prove to be *M. ornata*.

I can add from personal knowledge that *M. ornata* was grown in the Botanic Gardens in Jamaica for some years as "*Musa rosea*". And from this it is a clear inference that the "*Musa rosea*" used by Humphrey (*Ann. Bot.* 10 (1896) p. 1) for studying the development of the seed in Scitamineae was *M. ornata* Roxb. and not *M. rosea* Baker.

J. G. Baker, and later authors copying him, give as a synonym of *M. ornata*, *M. speciosa* Tenore, *Ind. Sem. Hort. Neap.* (1829) 16. I have not been able to check this, but note that Sagot (*Journ. Soc. nat. Hort. France*, 1887) did not regard the two as synonymous. As Sagot in the same article detected the error of the *Botanical Register's* "*M. rosacea*", he must have had good reason for regarding *M. speciosa* as distinct. He says it was cultivated in the Botanic Gardens at Algiers and in several places in Southern Europe, its original home not known. His description is of a smaller plant than *M. ornata* and a larger than *M. rosea* Baker: Height 1 metre or a little more; leaves 1 m. long, 30 cm. wide; inflorescence erect; bracts reddish-lilac, very persistent; fertile flowers few; fruit oval-oblong, 6 cm. long, yellowish, not pulpy; seeds black, rounded, depressed, muricate.

It should also be mentioned that in naming his *M. salaccensis* Zollinger (*Syst. Verz. Ind. Archip.* 74 (1854)) added in brackets (*ornata* Roxb. ?), which was a reasonable query at the time, as the species have some superficial similarity. Miquel in his *Flora van Nederlandsch Indie* (1855) put it the other way round, and after a description of *M. ornata* Latinized and abbreviated from Roxburgh added "*Musa salaccensis* Zoll. Cat. p. 74?" Whereupon certain later authors (but not J. G. Baker) have solemnly added "*M. ornata* Roxb." to the synonymy of *M. salaccensis*. The two are in fact very distinct species, in different sections of *Musa*.

*M. ornata* is a tolerant plant, of moderate size, and fairly ornamental, and by virtue of those characters has been grown in gardens in many parts of the tropics. As it was in Mauritius before 1805, it must have begun to travel several years before it was botanically described. The extent to which it has become distributed is illustrated by a note by Bassler in the *Journal of the New York Botanical Garden* (Vol. 27 (1926) pp. 49-54 and pl. 301, 302). Bassler found it growing on the edge of an Indian banana plantation on "the far upper edge of the Amazonian plain in Eastern Peru", in so remote a locality that he at first wondered whether he had come upon an indigenous American *Musa*. He identified it tentatively as *M. coccinea* Andr.?, but his plates leave no doubt of the identity of the plant.



The material in the I.C.T.A. collection was obtained in 1922 from the Royal Botanic Garden in Port of Spain, where it had been growing for some years un-named. We later obtained seeds of "*M. rosacea*" from the Buitenzorg Garden, which gave plants differing only in very small characters from our own. The plant, though of no direct use in banana breeding, has been very useful in genetical experiments for elucidation of the general mechanism of heredity in *Musa*, being sufficiently distant in relationship from the bananas to provide one parent in "wide" crosses for comparison with "narrow" crosses within *Eumusa*. The following description has been drawn up from our Introduction No. 1, and may not in all details cover the whole species.

*MUSA ORNATA* Roxb. Hort. Beng. (1814) p. 19 *nomen* ; Fl. Ind. vol. 2 (1824) p. 488 *descr.* et ed. 2 (1832) p. 666 : Miq. Fl. Ind. Bat. vol. 3 (1855) p. 589 : Kurz in Journ. Agric. Hort. Soc. India 14 (1865-66) 295-301 : D'Angremond in Flora 107 (1914) t. 11 : Quisumbing in Philippine Agr. Rev. 12 (1919) p. 15 : Backer, Flora von Java 3 (1924) 134 : Cheesman in Kew Bull. 1931 p. 297.

*Musa rosacea* Jacq. *sec.* Lodd. Bot. Cab. 7 (1822) t. 615 ; *sec.* Bot. Reg. (1823) t. 706 ; *sec.* J. G. Baker in Hook. Fl. Brit. Ind. 6 (1894) 261 et in Ann. Bot. 7 (1893) 219 ; *sec.* K. Schum. in Engl. Pflanzenreich 4. 45 (1900) pp. 13-28 ; *et sec. auctores alios multos, non Jacq.*

Plant stooling freely ; pseudostems slender, 1-3 metres high, rarely much more than 10 cm. in diameter at base, upper parts at first pale green, heavily waxy, later developing black blotches.

Leaf blades rather narrow oblong, up to 2 m. long, 35 cm. wide, truncate at apex, unequal-sided at base (one side rounded, the other more wedge-shaped), medium green on both surfaces, very lightly glaucous above, lightly so beneath ; midribs often flushed with red beneath ; petioles up to 60 cm. long, with definite *bx* regions (3-5 mm. wide) which are erect or slightly spreading above, clasping the pseudostem at base, not becoming scarious.

Inflorescence quite erect ; peduncle 2-3 cm. thick, glabrous ; sterile bracts usually 2, the first a shortened foliage leaf with broadened and coloured petiole, the second a fully coloured true bract, up to 30 cm. long ; basal flowers female, the number of female "hands" varying up to about 7, upper flowers male.

Female flowers 3-5 per bract, in a single row ; ovary 4 cm. long, green ; compound tepal 3.5 cm. long, deep orange-yellow, its lateral lobes ovate, 5 mm. long, with a minute dorsal appendage or none ; free tepal 3 cm. long, translucent white, ovate-oblong, with a rather obtuse yellow acumens ; staminodes one-third to one-half the length of the style ; style green, about 3 cm. long.

Male bud in advanced blooming top-shaped, acute, the bracts convolute or slightly imbricate at the tip. Bracts pale pink outside, yellow at the extreme tip, sulcate, slightly glaucous, the inner surface shining, of the same colour or slightly darker. Bracts lanceolate, the first about 10 cm. long, 5 cm. wide, those produced in very advanced blooming much smaller. Usually only one bract lifted at a time (occasionally two) ; bracts soon deciduous, not revolute on fading.

Male flowers 3-6 per bract in a single row ; compound tepal 3.5-4 cm. long, deep orange in the upper half paling to nearly white at base, its lobes similar to those of the female flower ; free tepal 3-3.5 cm. long, 1 cm. wide, oblong, with an acute acumen ; stamens at first as long as the free tepal, at length slightly exerted, their filaments longer than the anthers, the anthers purple.

Fruit bunch compact, the " fingers " strongly inflexed to stand nearly parallel with the rachis. Individual fruit 6-8 cm. long, 1.5-2 cm. in diameter, obscurely 4-5-angled, rounded at base to a short (5-7 mm.) pedicel, narrowed at apex into a short, broad, truncate acumen, which is rather sharply 4-sided at maturity. Pericarp about 1 mm. thick, pale somewhat greenish yellow at full ripeness ; pulp white. Seeds black, warty, irregularly angulate-depressed, 5 mm. across and 3 mm. high.

## A NEW APOCOPIS FROM BURMA.

N. L. BOR.

**Apocopis peguensis** Bor, sp. nov., ab omnibus specie bus hujus generis ad huc descriptis spiculis multo majoribus (ad 8.25 mm. longis) valde differt.

*Gramen* perenne radicibus crassis. *Culmi* ad 90 cm. alti, laeves, glabri, teretes, foliosi usque ad paniculam, ramis floriferis. *Foliorum laminae* ad 21 cm. longae, 8 mm. latae, lineari-acuminatae nervo medio crasso, in apicem validum attenuatae, utrinque e tuberculis ortis albis pilis dense tectae, inter pilos scabrae ; laminae superiores vestigiales ; *foliorum vaginæ* nonnihil laxae, carinatae, suprene pilis albis adpressis e tuberculis ortis dense tectae ; *ligula* membranacea, 1.5 mm. longa, lacerata, dorso albis pilis densis tectae.

*Inflorescentia* duobus racemis ad 7 cm. longis composita. Rhachis fragilis ; internodia truncato-cuneata, nonnihil compressa, angulis pilis castaneis rigidis ad 5 mm. longis instructa, cum spicula contigua decidua. *Spiculae* 8.25 mm. longae, oblongo-truncatae. Spicula sessilis hermaphrodita ; *gluma inferior* 7 mm. longa, 4 mm. lata, coriacea, oblonga, superne truncata, margine superiore ciliata, 7-nervis, nervis dorso prominentibus et superne anastomosantibus, glumam superiorem et flosculos complectens ; *gluma superior* anguste obovato-oblonga, 8.25 mm. longa, in tres partes aequales nervis lateralibus divisa ; partes duae laterales hyalinae, flosculos complectentes ; pars media cum nervo medio chartacea, carinata, brunnea, carina scabra nonnullis pilis longis, ceterum glabra. *Anthoecium inferum* ♂ vel vacuum ; *lemma* 5.5 mm. longum, oblongo-ovato-truncatum, 1-nerve, hyalinum, margine superiore ciliatum ; *palea* angusta, hyalina, margine superiore truncato ciliata. *Anthoecium superum* ♀ vel hermaphroditum ; *lemma* 7 mm. longum, 1 mm. latum, lineare, apice bilobatum, valde 1-nerve, basi marginibusque hyalinum, lobis marginibusque breviter ciliatum ; nervus medius in aristam validam tortam 3 cm. longam productus ; arista inferne antrorse scabra ; *palea* 4 mm. longa, 3 mm. lata, obovato-truncata, ovarium complectens, margine superiore ciliata. *Antherae* 3 mm. longae ; *styli* duo, 2 mm. longi ; *stigmata* plumosa, 2.5 mm. longa. *Spicula* pedicellata ad stipam gracilem pilis rigidis rufis ad 5 mm. longis instructam redacta.

BURMA. Roadside near Thitni (Old Forest Rest House), Salu Reserve, Pegu Division, 7.9.1939, *U Thein Lwin*, 59 (typus in Herb. Kew. et in Herb. Dehra Dun).



## Two little known species of *Ballia*, *B. beckeri* Schmitz and *B. hamulosa* Ag.

C. I. DICKINSON

In 1930 Kew received some very fine specimens of algae collected in 1929 by Mr. W. G. Rump in Richard's Bay, Natal. Among them was a *Ballia* which at the time was identified with *B. beckeri* of F. Schmitz. Through the courtesy of the Keeper of the Botanical Department of the British Museum the Natal specimens were compared with one from Schmitz collected by Dr. Becker in the type locality, the Kowie, and found to be the same.

Schmitz who died at an early age left a number of manuscript names based on Becker's collections and some of these were afterwards taken up by A. Mazza (+) who described *B. beckeri* at some length though without a figure.

De Toni in his *Sylloge Algarum* (1924 Supplement) states that in spite of what Mazza says, after comparing his own material collected by Becker from the Kowie with Harvey's *B. robertiana* from Australia, it is hardly to be distinguished from that species.

Considering this statement and that as far as I know there are no records of *B. beckeri* since its discovery at the end of last century it seems worth while drawing attention to the distinct differentiation of the Natal plant from the *B. robertiana* of Australia. Macroscopically the Natal *Ballia* has a slight resemblance in contour to *B. robertiana* but the more one looks at it the more slight that resemblance becomes, and microscopically the two are widely different.

The salient points of the contrast between the two species are :—

1. The width of the frond just below the tip is about 1–1.75 mm. in *B. beckeri* as against 0.75–1 mm. in *B. robertiana*.
2. The habit of *B. beckeri* is distinctly lax compared with *B. robertiana*.
3. *B. beckeri* reaches a length of 20 cm. whereas *B. robertiana* according to Harvey is from 4 to 6 ins. i.e. about 10–15 cm.
4. In *B. beckeri* the opposite pinnae are very unequal and the larger pinnae being devoid of pinnules on the first 3 to 5 distal joints, have a characteristic shape which becomes evident when the figure is compared with that of *B. robertiana* in Harvey's *Phycologia Australica*, the latter being a fair representation of the Australian species.

The Natal plants are tetrasporic, the cystocarpic plants being apparently unknown.

While on the subject of *Ballia* attention was drawn to *B. hamulosa* of Agardh, another species which has remained in obscurity. At Kew this is represented by a specimen in poor condition "Curante J. G. Agardh distributae". Its appearance under the microscope suggested that a search in the genus *Antithamnion* might be profitable with the result that it was seen to resemble very closely *A. mucronatum* another of Agardh's species but one which he created some 40 years earlier. The Kew specimen of *B. hamulosa* is very difficult to distinguish from a specimen of *A. mucronatum* in Agardh's distribution. Both appear to be old and weathered specimens and are difficult to match with the rest of the Kew

material of *A. mucronatum*. However, the details are essentially the same. All have predominantly ternate branching with the branches sharply mucronate. In all the plants examined spines are present, usually on the second and third joints, and occasionally they are more numerous. Again in any of the specimens some spines may be seen turned down in the form of hooks. In the two specimens distributed by Agardh the branches are a little stouter and a little less sharply mucronate, otherwise there is no apparent difference between these and the rest of the material of *A. mucronatum*. For the time being *B. hamulosa* must be regarded as a doubtfully valid species, but the question cannot be settled without reference to Agardh's herbarium.

*Ballia* has generally been regarded as having a cold water or cold temperate distribution in the southern hemisphere. There are the four well known species *B. callitricha*, *B. scoparia*, *B. mariana* and *B. robertiana*, the doubtful *B. hamulosa* and lastly *B. sertularioides* recently transferred from *Callithamnion* by Papenfuss (5). All these are cold water plants ranging through the Falkland Islands, Tristan da Cunha, Kerguelen, South Australia and Tasmania, with the exception of the commonest species *B. scoparia* which extends as far north as the North Island of New Zealand in the Pacific only. It is therefore worthy of note that this one species *B. beckeri* is flourishing in the warm waters of the Indian Ocean. The Natal plants are in excellent condition so that there is little likelihood of their having travelled any distance. Richard's Bay lies in latitude 28° 50' S. and comes under the influence of the warm Agulhas current. It is north of Durban where Eyre and Stephenson (2) have demonstrated a high proportion of tropical species in the marine fauna and flora. Although an exact comparison is not possible it does appear from the only figures available which are those of Isaac (3) for Durban, and Cranwell and Moore (1) for the Poor Knights' Islands, New Zealand, that Richard's Bay would have a considerably higher maximum temperature than the northern limit of the genus in New Zealand. There is no information as to the depth at which *B. beckeri* grows but it is unlikely that it occurs at a depth at which there would be an appreciable decrease in temperature.

I am indebted to Dr. Pichi-Sermolli for translating the Italian of Mazza's paper.

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*Ballia beckeri*. Fig. 1.  $\times 80$ . Part of a branch showing two secondary branches (a) bearing unequal pinnae. The smaller branches (b) usually occur in pairs on the same side of the axis but this is not shown in the figure.

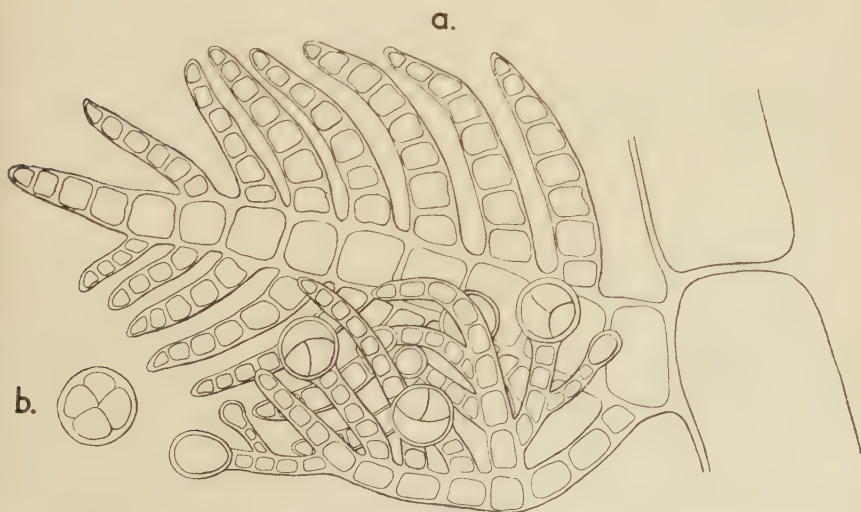


Fig. 2.  $\times 300$ . (a) An abaxial pinna bearing tetrasporangia. (b) A ripe sporangium.



## Additional Notes on *Leycesteria*

H. K. AIRY SHAW.

Shortly after the publication of the revision of *Leycesteria* in *Bull. Misc. Inf.*, Kew, **1932**, 161 (1932), two plants not there accounted for came under notice. It is perhaps even now worth bringing them forward.

From seed sent from Nepal, Mr. T. Hay of Hyde Park raised a form of *L. formosa* Wall. differing conspicuously from the common Himalayan form in its glaucous foliage. In other respects, however, it presented no unusual features, except that the inflorescences were rather poorly developed. It may be designated :

***Leycesteria formosa* f. *glauca* Airy Shaw**, f. nov. foliis subtus conspicue albo-glauciscentibus, supra etiam magis glauco-viridibus, inflorescentiis (? an semper) brevibus distincta.

NEPAL. Raised from seed collected in Nepal by *Major Lall Dhwoj* ; cult. et comm. *T. Hay*, 30 Sept. 1932, and 14 Aug. 1934.

It was from Nepal (Sheopore) that Wallich originally described *L. formosa*. Hooker and Thomson's Khasia specimens (see *K.B.*, l.c. 168) show an approach to f. *glauca* in the rather glaucous undersurface of the leaves.

The known range of *L. glaucophylla* (Hook. f. et Thoms.) Hook. f. ex C. B. Cl., formerly supposed to be confined to Sikkim (see *K.B.*, l.c. 173), was extended to Burma by a specimen collected by Capt. F. Kingdon Ward in 1932 ; see Fischer in *Bull. Misc. Inf.*, Kew, **1940**, 290 (1941). An interesting specimen of the same scarce species, obtained by Capt. Kingdon Ward in Assam in 1928 (but not received till late in 1932), exhibits a slight but definite divergence from the type, for the style, instead of being pubescent (a character otherwise known only in *L. crocothyrsos* Airy Shaw), is quite glabrous. It may be distinguished as follows :

***Leycesteria glaucophylla* var. *psilostyla* Airy Shaw**, var. nov. a planta typica stylo glaberrimo nec pubescente distincta.

ASSAM. Delei Valley, 28° 21' N., 96° 37' E., 2700 m., 7 June 1928, *F. Kingdon Ward* 8307 (Herb. Kew.) : " A limp loosely branched shrub growing in steep dank gullies in the rain forest. Flowers cream."

## NEW SPECIES AND VARIETIES OF THE PERSIAN FLORA : III\*

DR. A. PARSA

## IRIDACEAE.

**Iris keredjensis** Parsa, sp. nov. ex affinitate *I. susianae* L. petalis obovatis pilis intense violaceis barbatis distinguenda. *I. squalenti* L. etiam affinis sed segmentis interioribus violaceo-variegatis (nec brunneis) differt.

*Herba* uniflora, rhizomate brevi repente, caulibus crassiusculis humilibus 3-7 cm. longis. *Folia* numerosa, anguste linearia,  $\pm$  falcata, 20-30 cm. longa et 1.5-2.5 cm. lata, demum inferiora recurva et summa erecta, vel omnia recurva. *Spatha* bivalvis, valvis subaequilongis lanceolatis longe acuminatis 3.2-3.5 cm. longis et 8-10 mm. latis, perigonii tubum superans. *Pedicellus* 7-10 mm. longus, ovario cylindrico triplo vel ultra brevior, perigonii tubo aequalis. *Perigonii segmenta* exteriora elliptica vel obovato-elliptica, 3-4 cm. longa et 1.5-2 cm. lata, apice rotundata, late et abrupte unguiculata, infra medium violaceo-barbata, ceterum albo-flavida; interiora obovata, exterioribus aequilonga et vix latiora, apice rotundata, basi indistincte in unguem attenuata, alba vel violaceo-variegata. *Antherae* 7-10 mm. longae, filamentis dimidio breviores. *Stigmatis lacinae* 2 cm. longae, obovato-cuneatae, lobis subdeltoideis.

N. PERSIA. Kuh Dasht, Keredj, 2200 m., 20 May 1941, Parsa 49.

In comparison with *Iris squalens* L. it will be seen that the flower-colour of *I. keredjensis* is white and violet. The blade of the outer perianth segment is elliptic (not obovate as in *I. squalens*) and bears a conspicuous violet beard. The perianth tube is much shorter than the stalked ovary; in *I. squalens* it equals the ovary, which is sessile.

## LILIACEAE.

**Allium decipiens** Fisch. var. **integrifolium** Parsa, var. nov. a typo bulbi tunicis exterioribus brunneis (nec cinerascentibus), foliis margine glabris (nec serrulato-scaberulis) recedit.

CRIMEA. Kamynstih, 10 June 1896, Callier, iter tauricum secundum 213.

N. PERSIA. Mashad, steppe, June 1941, Parsa 180 (type).

**Allium kazerouni** Parsa, sp. nov. a *A. noeano* Reut. caulibus sulcatis, foliis integris, tepalis 3 mm. tantum longis, staminibus tepalis plus minusve aequalibus, stylo stamina aequante vel superante, stigmate punctiformi differt.

*Bulbi* ovati, solitarii, tunicis integris albo-membranaceis. *Caulis* erectus, 25-35 cm. altus, glaber, sulcatus, teretiusculus, 2-4 foliatus. *Folia* 20-30 cm. longa et 10-13 mm. lata, late linearia, cauli plus minusve aequalia, margine integra saepe crispula. *Spatha* hyalina, univalva, pedicellos subaequans vel superans et amplexans, latere fere ad basin fissa, ovato-subrotunda vel ovata, longe et abrupte acuminata. *Umbella* pluri- vel multi-flora; pedicelli valde inaequales, floriferi c. 2-2.5 cm. longi, fructiferi 3.5 cm. usque longi, perigonium pluries superantes, basi nudi. *Tepala* 3 mm. longa, rosea vel alba, ovato-lanceolata, longe et

\*Continued from K.B. 1948, p. 228.

abrupte acuminata. *Stamina* tepala subaequantia vel vix superantia, basi cum perigonio in cupulam coalita, parte libera filiformia. *Ovarium* subglobosum, apice rotundatum vel retusum; stylus longiusculus, stamina aequans vel superans. *Capsula* glabra, atropurpurea, obovata vel orbicularis.

S. PERSIA. Kotal Abdui, between Kazeroun & Shiraz, 17 May, 1885, *Stapf*. Tang Kaeldu, between Kazeroun & Shiraz, 26 May 1885, *Stapf*. Kotal Henan, Kazeroun, 7 May 1885 and cult. in hort. bot. vindob. *Stapf* (type).

**Allium (Crommyum) ramazanicum** Parsa, sp. nov. *A. kotschyi* Boiss. affine bulbis suborbicularibus, foliis saepe binis, umbellis 11-20-floris, filamentis perigonio triplo brevioribus omnibus apice integris diversa.

*Bulbus* mediocris, solitarius, 5-8 mm. latus et longus, tunicis integris albo-hyalinis. *Scapus* pumilus 6 cm. usque longus, striatus, tenuis, ad medium usque subcrassior. *Folia* 8-10 cm. longa et 1.5-3.5 mm. lata, bina, linearia, falcata, apicem versus contorta, subpruinosa, striata, margine serratulo-scabra, utrinque attenuata, plana vel revoluta, scapum ad medium versus vaginantia. *Umbella* hemisphaerica, 11-20-flora. *Spathae valvae* scariosae, ovatae, apice attenuatae, pedicellis subaequales vel longiores basi vaginantes. *Pedicelli* inaequales, floribus subaequales vel vix longiores. *Perigonium* 3-3.5 mm. longum, repalis lineari-lanceolatis, alternatis paullo angustioribus, omnibus obtusis vel acutiusculis basi breviter coalitis albidis vel dilute roseis nervo viridi. *Stamina* filamentis perigonio subtriplo brevioribus omnibus anguste triangularibus apice abrupte cuspidatis. *Stylus* staminibus subaequalis vel vix brevior. *Ovarium* perigonio subquadruplo brevius.

S. PERSIA. Shahzad-i-Kuh, 3100 m., 30 June 1941, *Parsa*.

**Allium stenopetalum** Boiss. et Kotschy var. **pumilum** Parsa var. nov. caule nano infra umbellam bifoliato distincta.

E. PERSIA. Schir Kuh, 3600 m., mountainside, 18 May 1932, *Guiseppe* 43.

**Bellevalia shiraziana** Parsa, sp. nov. habitu et characteribus *B. nivali* Boiss. et Kotschy affinis, folio obtuso vel acutiusculo (nec acuto) et perogonii laciniis tubo vix (nec triplo) brevioribus ovato-orbicularibus acutis distincta.

*Bulbi* ovati. *Folia* 3-5, oblanceolata vel linearia, utrinque attenuata, 10-12 cm. longa et 3 mm. lata, obtusa, supra viridia, infra pallidiora, utrinque striata, scapo longiora. *Scapi* 1-2, 4-6 cm. longi, erectiusculi, racemo brevi ovato-triangulari 8-11 mm. longo et 5-10 mm. lato, pedicellis purpureis 0.5-1 mm. longis erectis perigonio multo brevioribus; bractae ovatae minimae pedicellis vix breviores. *Perigonium* tubuloso-campanulatum, 3-4 mm. longum et 2 mm. latum, laciniis ovato-orbicularibus vel lanceolatis acutis vel acutiusculis tubo vix brevioribus. *Filamenta* triangularia, apice attenuata, antheris elliprico-orbicularibus subtrigonis apice truncatis subretusis luteis. *Ovarium* ellipsoideum.

S. PERSIA. Desht-arjin, near Shiraz, 2400-1800 m., 20-22 May 1885, *Stapf*. Kuh Chenar, near Shiraz, 3000 m., *Stapf*.



**Eremurus iranicus** Parsa, sp. nov. *E. inderiensi* Stev. affinis, a quo pedicellis perigonio longioribus, filamentis perigonii dimidium aequantibus differt.

*Folia* linearia, striata, 25-30 cm. longa, 2-2.5 mm. lata, subfloccosa. *Scapus* sparse subfloccosus, foliis aequalis vel vix brevior, 20-30 cm. longus. *Racemus* pluriflorus, laxiusculus, 12-16 cm. longus, expansus 20 mm. usque latus. *Bracteae* scariosae, lanceolatae, longe acuminatae, sparse albo-floccosae, pedicello aequales vel longiores, nervis tribus percursis. *Pedicelli* adscendentes, 4-5 mm. longi. *Perigonium* infundibuliformi-campanulatum, basi angustatum, in sicco albo-brunneum (in vivo pallide purpurascens?), segmentis stria lata viridescente notatis, omnibus trinerviis nervis approximatis oblanceolatis obtusis 5-7 mm. longis. *Stamina* perianthio breviora. *Stylus* perianthio vix brevior, 2-3 mm. longus. *Capsula* ellipsoideo-globosa, 3.5 mm. longa.

S. PERSIA. Kuli Barf, near Shiraz, 19 June 1885, *Stapf* 2107, 2108, 2097 (type) 2098.

**Muscari bushiricum** Parsa, sp. nov. a *M. comoso* Mill. pedicellis omnibus saepe arcuatis, perigonio fertili cylindrico diametro suo longiore, coma florum sterilium obovatum vel cylindricum, pedicellis flores aequantibus differt.

*Bulbus* 2-2.5 cm. diametro. *Folia* 4-8, 25-40 cm. usque longa, 3-4 mm. lata, linearia, densa, saepe constricta, scapo florifero subaequalia vel longiora, utrinque glaucescentia, parte inferiori brunneo-flavida vel rubescentia. *Scapus* 25-35 cm. altus, basi fusco-ruber, erectus. *Racemus* 10-20 cm. longus, longe cylindricus, laxiflorus. *Pedicelli* florum fertilium et sterilium arcuati, floribus aequales vel leviter longiores. *Perigonium* florum fertilium cylindricum, 4.5-5 mm. longum, 1.5-2 mm. latum, olivaceo-brunneum, striis paucis atris percursum, dentibus atro-purpureis triangulari-elongatis reflexis obtusis. *Capsulae* ovato-orbiculares.

S. PERSIA. In segetibus ad Bushire, 13 March 1893, *Bornmüller* 663 (type : sub nom. *M. persico* Bornm. et Hausskn.). Shiraz, in cornfields, Feb.-March 1926, *Chick* 21.

W. PERSIA. Musjid-i-Sulimain, 600 m., March 1927, *Macmillan* 288, 289.

IRAQ. Chemchemal, 6 Apr. 1929, *Rogers* 6274 A (p.p.).

var. **pumilum** Parsa, var. nov. planta saepe humilior, foliis tenuioribus 10-15 cm. longis et 1.3 mm. latis a typo distincta.

IRAQ. Chemchemal, 6 Apr. 1929, *Rogers* 6274 A. (type).

W. PERSIA. Musjid-i-Sulimain, March 1927, *Macmillan* 287.

**Muscari iranicum** Parsa, sp. nov. ab affini *M. graeco* Heldr. foliis scapo brevioribus, pedicellis arcuatis flore longioribus, floribus sterilibus clavatis longe pedicellatis distinguenda.

*Bulbus* 14-15 mm. diametro. *Folia* 3-6, 15-30 cm. usque longa, 1.5-4 mm. lata, linearia, atro-viridia, striata, scapo breviora. *Scapus* 35-40 cm. altus. *Racemus* 15-20 cm. usque longus, cylindricus, pluriflorus et laxiflorus. *Flores* steriles numerosi, clavati, violaceo-caerulei, striati,

longe pedicellati. *Flores fertiles* tubuloso-cylindrici, 3-3.5 mm. longi, fauce paullo constricti, dentibus valde recurvis, atro-caerulei, pedicellis arcuatis perigonio brevioribus. *Capsula* orbicularis.

S. PERSIA. Kuh Daeschta, near and north of Kazeroun, 7 May 1885, *Stapf* 896. Doun, near Kazeroun, 4 May 1885, *Stapf* s.n. Khane Zenian, 4 June 1885, *Stapf* s.n. Zui-i-Saefid, near Daeschta-aerdschin between Kazeroun and Shiraz, 2 June 1885, *Stapf* s.n. (type). Kuh Barf, near Shiraz, 19 June 1885, *Stapf* s.n.

**Ornithogalum kojuricum** Parsa sp. nov., *O. tenuifolium* Guss. affinis sed pedicellis inferioribus bracteis brevioribus, filamentis perianthium subaequantibus sat diversa.

*Bulbus* ovoideus, 13-15 mm. diametro. *Caulis* tenuis, 10 cm. usque altus et 1 mm. crassus. *Folia* angustissime linearia, utrinque attenuata, 12 cm. usque longa et 1 mm. lata, apice obtusa vel obtusiuscula. *Inflorescentia* pauciflora (4-5-flora) laxa, obovoidea, 1.5-2 cm. longa; pedicelli 12 mm. usque longi, anthesi plus minusve recti erecto-patentes, fructiferi capsulam rectam gerentes; bractee ovato-ellipticae, longe et abrupte acuminatae, pedicellis vix longiores. *Perigonii phylla* elliptico-linearia, 6 mm. longa, late albo-marginata, rotundata sed apice ipso acuminata, parte media viridi. *Filamenta* lanceolata, apice subito angustata, perigonio vix breviora. *Capsula* orbicularis vel obovoideo-orbicularis, matura 3-4.5 mm. longa, costis acutis, valvulis subconvexis.

N. PERSIA. Kojur, steppe of Namazgah, 3000 m., 1 July 1941, *Parsa* 312.

var. **pluriflorum** Parsa, var. nov. inflorescentia pluriflora, pedicellis fructiferis patentibus differt.

N. PERSIA. Kojur, steppe of Namazgah, 3000 m., 2 July 1941, *Parsa* 154.

**Biarum platyspathum** Bornm. var. **bakhtyarum** Parsa var. nov. spatha angustiore 2 cm. tantum lata extra albido-lutea vel pallide purpurea (nec purpureo-punctata) differt.

S. PERSIA. Fars: Abibarik, about 6 miles from E. Assupas, 1 Sept. 1885, *Stapf*.

**A New Variety of Craspedorhachis from Angola:—Craspedorhachis rhodesiana** Rendle var. **gracilior** C. E. Hubbard, var. nov.; a typo differt culmis gracilioribus 1-1.3 mm. diametro simplicibus vel e nodis inferioribus ramosis usque 9-nodibus, foliorum vaginis internodiis fere aequilongis vel eis longioribus glabris, laminis usque 11 cm. longis 1.5-3 mm. latis, spiculis 2.5-2.7 mm. longis.

ANGOLA: Benguella; country of the Ganguellas and Ambuellas, *Gossweiler* 3789 (type), 4102. Moxico; Vila Luzo, Muhango (Chana Sa Pemba), near the R. Sabuinguila, 1200 m., May 1937, *Gossweiler* 11306.

Typical *C. rhodesiana* does not appear to be so densely tufted. It has fewer-noded unbranched and stouter culms up to 3 mm. in diameter, broader leaf-sheaths, the basal of which are loosely hirsute at least when young, and broader leaf-blades 4-6 mm. wide.—C. E. HUBBARD.

## NOTES ON CAREX : XVII\*

E. NELMES.

## A NEW SPECIES FROM INDIA, FORMING A NEW SECTION.

The collection of Indian *Carex* in the Kew herbarium has recently been considerably enriched by specimens collected in the Punjab, Sikkim, and Tibet, chiefly by Dr. N. L. Bor. Among them is a remarkable new species.

As it is unispicate, this very dark little sedge falls into Kükenthal's subgenus *Primocarex*, but, by the frequent occurrence of an empty bract, and even, rarely, an accompanying spike, at a short distance below the usual terminal one, it well illustrates the artificiality of this subgenus. Kükenthal distinguishes this from the other three subgenera in his treatment (Engl. Pflanzenreich, IV, 20: 1909) simply by its unispicate character; other and more important characters, such as differences in the shape of the utricle and achene, and accompanying variation in number of stigmas, being entirely disregarded.

This tendency in the *Primocarices* towards the development of accessory spikes, or their rudiments, besides indicating a multispicate ancestry, seems to point to an ineradicable instability, which leads, under favourable conditions, to a movement backward along the evolutionary paths.

Kreczetowicz, in his work, "Are the sedges of Subgen. *Primocarex* Kük. primitive?" (Journ. Bot. U.R.S.S., 21: 395-424, figs. 1-16: 1936), discusses the various ways in which, as he thinks, the members of *Primocarex* have reached their degraded state.

It is not my purpose here to describe the different types of "digressive reduction" explained by Kreczetowicz—"alpigenous, altigenous, arctogenous, glaciogenous"—which arose, he believes, under the conditions of periglacial and postglacial migrations; nor the "transmutive" type of reduction which, he says, was connected with the regression of the equator southwards from the Mediterranean area during late Tertiary and early Quaternary times. I mention them, however, because *Carex borii* not only belongs to the group of reduced sedges, *Primocarex*, but also seems to have a special and interesting place in Kreczetowicz's story of descent.

In that part of his work dealing with reduction in the multispicate *Indocarices*, after stating that the transmutive type is especially characteristic of this group, he says that one can conceive of another kind of reduction having taken place, i.e., simple quantitative reduction of spikes from below upwards, the final result being a single, apical, androgynaeceous spike. Though feeling certain that this kind of reductive process had in fact occurred, Kreczetowicz hastened to admit that examples were hard to find. He points out that the "presence of an axial appendage [rhachilla] in the majority of montane *Primocarices* expressly speaks against this, seeing that the overwhelming majority of present-day *Indocarices* have no rhachilla in the utricle". If Kreczetowicz had lived—he was killed in the siege of Leningrad—he would, I think, have accepted *Carex borii* as confirming his postulate, for I have found no rhachilla in the utricles of this uni-androgynaeceous-spiked sedge.

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\* Continued from K.B. 1948, 109 (1948).



One may, therefore, in a phylogenetic sense, regard Dr. Bor's sedge as an extremely degraded *Indocarex*, the numerous spikes of the ancestral inflorescence being reduced in number to the lowest possible degree—a single terminal one. At the present day, as a '*Primocarex*', it appears to represent a distinct section, occupying a position intermediate between Sect. *Junciformes* Boeck. and Sect. *Petraeae* O. F. Lang in Kükenthal's monograph in the Pflanzenreich. A description of the new section follows.

Sect. **Nigellae** *Nelmes*, sect. nov. A Sect. *Junciformium* Boeck. et Sect. *Petraearum* O. F. Lang spicis submultifloris, squamis atrorubidis, utriculis ellipsoideis distinguenda.

**Carex borii** *Nelmes*, species nova.

Dense caespitosa. *Rhizoma* breve, tenue (circiter 0.75 mm. diametro), squamis fulvis obtectum. *Culmi* 2.5–5 cm. alti, 0.5–0.6 mm. crassi, obscure vel obtuse trigoni, laeves, inferne foliati, basi vaginis foliorum emarcidis circumdati. *Folia* culmo paullo longiora, crassa, conduplicata, circiter 0.5–0.8 mm. lata, stricta vel leviter recurvata, saepe apice subcircinnata, inferne laevia, apicem versus attenuata marginibus minute scaberula, breviter vaginantia. *Spica* 1, saepe bractea vacua squamiformia raro spicam alteram minorem breviter pedunculatum suffulciente 3–6 mm. infra spicam sita, terminalis, 6–9 mm. longa, 4.5–6 mm. lata, ovoidea vel oblongo-ovoidea, erecta, subdensiflora, ebracteata, androgynaecea, parte mascula quam pars feminea multo brevior. *Squamae femineae* 2–2.5 mm. longae, 1.75–2 mm. latae, ovatae vel late ovatae, apice plerumque obtusae vel obtusissimae, interdum subacutae, interdum planiusculae sed saepe cymbiformes, basi incurvae, vix translucetes, atrorubidae, interdum marginibus angustissime albo-hyalinae, tenuiter carinatae, carina pallide viridi ad apicem squamae non attingente. *Utriculi* 2.5–3 mm. longi, circiter 1 (1.25) mm. lati, ellipsoidei, laeves, glabri, trigoni, demum patuli vel patentes, enerves, non marginati, inferne straminei, superne atrorubri, membranacei, stricti, non stipitati, apicem versus compresso-attenuati, in rostrum cylindricum ore brevissime albido-hyalinum subintegrum demum erosum dorso usque 0.5 mm. fissum subabrupte contracti. *Nux* 1.75–2 mm. longa, 0.9–1 mm. lata, ellipsoidea vel ellipsoideo-obovoidea, trigona, faciebus planis vel concaviusculis, dense minute puncticulata, straminea, demum brunneo-olivacea, non stipitata, vix vel brevissime rostrata. *Stylus* basi aequalis, rubidus. *Stigmata* 3, sublonga.

INDIA : Punjab, Lahul, Ladakh, Bara Lacha La, 4800 m., *N. L. Bor* ; Lahul, Lingti, close to water, 3000 m., 29 June 1941, *N. L. Bor* 15019 (type).

## NOTES ON CAREX : XVIII

E. NELMES.

Among the more interesting *Carices* collected in Siam by the late Dr. A. F. G. Kerr was one which, when I was preparing a key to the *Carices* of Malaysia and Polynesia, was considered to be too immature to describe and include in it. The species was obviously new and seemed to belong

to Sect. *Mapaniifoliae* Nelves et Airy-Shaw (in Hook. Ic. Pl. 35: sub t. 3434, p. 3 : 1943), making a third occupant, the others being *Carex helferi* Boeck. and *C. mapaniifolia* Ridl.

It can now be described, for fruiting specimens have been collected, very near Kerr's locality, on the Netherlands Kwae Noi River Basin Expedition of 1946, and the earlier tentative determination which placed the plant in Sect. *Mapaniifoliae* is now confirmed. This newcomer to the section is much more distinct from the other two species than they are from each other, exhibiting characters more reduced than theirs, particularly its sessile secondary panicles (a very uncommon character), inconspicuous non-sheathing bracts, and almost nerveless utricles.

**Carex hypotracheia** Nelves, sp. nov. ; *C. helferi* Boeck. affinis sed foliis angustioribus infra hispidulis, paniculis secundariis sessilibus, bracteis minoribus haud vaginantibus, squamis angustioribus aristas brevioribus, utriculis minoribus enerviis vel paucinerviis, rostris glabris, nucibus minoribus facile distinguenda.

Dense caespitosa. Culmi centrales, trigoni, 35–55 cm. alti, inferne 2 mm. crassi, superne 1.5 mm. crassi, suberecti, leviter flexuosi, rhachibus exceptis laeves, subscapiformes, costati, stramineo-brunnei, basin versus folia parva setacea vaginantia membranacea gerentes, basi foliis 3–6 radicalibus haud vaginantibus circumdati, tota basi plantae cataphyllis magnis elongatis membranaceis demum emarcidis vestita ; rhachis scaberula, praecipue superne. Folia radicalia inflorescentiam longe superantia, 10–25 mm. lata, erecta vel suberecta, lineari-elliptica, plana vel planiuscula vel subplicata, basi marginibus fusco-brunnea haud vaginantia apicem versus longe acuminata, supra saepe septato-nodulosa superne setulosa ceterum laevia, infra per totam superficiem sed praecipue superne setulosa, subrigida, multinervia, sed infra nervo medio et supra nervis 2 lateralibus validioribus, basi in petiolum longum pallidum conduplicatum contracta. Infructescentia composita, gracilis, inferne interrupte paniculata, 9.5–17.5 cm. longa, erecta ; paniculae secundariae 8–12, singulae, subglobosae vel ovoideae vel ovoideo-cylindricae, vel oblongo-cylindricae, densissimae, sessiles, 1–4.5 cm. longae, 8–15 mm. crassae, inferiores approximatae, superiores continguae vel aggregatae ; ramuli 1–9, densissimi, globosi, sessiles, in spicas plures simplices sessiles dense aggregatas iterum digesti. Bractea infima subherbacea, culmo brevior, bracteae superiores squamiformes, aristatae ; bracteolae squamiformes sed squamis multo minores, saepe hispidulae, aristatae ; arista hispidula. Cladophylla bracteoliformia sed non aristata, interdum biloba. Spicae androgynaeceae vel spica suprema interdum mascula, laterales demum patentes, sessiles, dense aggregatae, circiter 5 mm. longae, parte mascula quam pars feminea longiore, parte feminea pauciflora. Squamae femineae anguste oblongae (circiter 0.75 mm. latae), ovatae vel ovato-lanceolatae vel oblongo-lanceolatae (circiter 1.5 mm. latae), inferiores paucae interdum minores vacuae, apice sub-acutae, obtusae vel obtusissimae, cymbiformes, 2.25–3 mm. longae (arista exclusa), pallidae vel stramineae, demum pallide brunneae, apice interdum ciliolato-erosae, dense et minute alveolatae, tenuissimae sed valde multinervosae hinc inde interdum minute furfuraceo-hispidulae, nervo medio et nervis 2 lateralibus sursum convergentibus dorso in

aristam latam laeviusculam vel marginibus sparse hispidulam excurrentibus; *arista* 0.25-1 mm. longa. *Utriculi* ellipsoidei vel rhomboideo-ellipsoidei, trigoni, angulis prominentibus, faciebus concaviusculi, 4.25-4.75 mm. longi, 1.2-1.4 mm. lati, enerves vel paucinerves, inferne glabri, superne vel apice  $\pm$  hispiduli, anguste marginati, membranacei, inferne attenuati et in stipitem brevem contracti, superne in rostrum basi subinflatum planiusculum latum leviter attenuatum 2-2.5 mm. longum vix vel angustissime marginatum marginibus hispidulum bidentatum glabrum pallidum subsensim vel subabrupte contracti; *os* oblique sectum; *dentes* ventre 0.25 mm. et dorso 0.5 mm. longi. *Nux* rhomboideo-ellipsoidea sed inferne attenuata, prominenter trigona, angulis triente medio incrassatis, faciebus concaviusculis, circiter 2.25 mm. longa, 1.2-1.3 mm. lata, rubido-brunnea, dense et minute puncticulata, vix vel brevissime pallide stipitata, rostrata; *rostrum* validum, subpallidum conico-cylindricum, 0.2-0.25 mm. longum. *Stylus* basi vix vel leviter incrassatus. *Stigmata* 3.

SIAM: Kanburi; Wangka, by stream in bamboo forest, c. 200 m. (flowering), 10 February 1926, *Kerr* 10488; near Neekey and Wangka, deep in valley, in damp sandy loam, 150 m. (fruiting), 16 May 1946, *Wickian* (Kwae Noi River Basin Expedition, 1946, No. 591) (type).

***Origanum bevani*.**—This species, which is endemic to the island of Cyprus, was described by E. M. Holmes in 1915, but had first been collected by Sintenis and Rigo as long ago as 1880. Holmes's name has recently been overlooked and the plant has been re-described as *Origanum pseudo-onites* by Lindberg. It seems desirable, therefore, to call attention to the earlier name before this later synonym is adopted into general use.

***Origanum bevani*** Holmes in *Perfumery & Essential Oil Record*, 6: 19 (1915).

Syn. *O. pseudo-onites* Lindb. fil. *Iter cyprium* in *Act. Soc. Sci. Fenn. N.S.B.*, 2, No. 7: 29 (1946).

CYPRUS. Apparently restricted to the immediate neighbourhood of Lapithos: *Sintenis & Rigo* 612; *M. Bevan* s.n. (comm. *E. M. Holmes*); *Lindberg* s.n.; *Kennedy* 1639.

*O. bevani* is very distinct from the other species of *Origanum* sect. *Majorana* which occur on Cyprus. These are *O. majoranoides* Willd. and *O. dubium* Boiss., two species so closely allied that they can only be distinguished with difficulty on morphological characters, though their essential oils are markedly different. Both these species have small leaves which are silvery on the lower surface; those of *O. bevani* are pilose but green. *O. bevani* also has a stouter less wiry stem than the other species.

*O. bevani* is most closely allied to *O. onites* L., a species widespread in the Balkan Peninsula and Asia Minor, but not known to occur in Cyprus. The most obvious distinguishing character lies in the inflorescence, that of *O. bevani* being an oblong panicle, while *O. onites* has a broad, flat-topped corymb. Lindberg notes that *O. bevani* has lilac-coloured anthers; those of *O. onites* appear to be yellow.

B. L. BURTT.



## THE RUSTAM HERBARIUM, 'IRAQ. Part II.

## Systematic List (continued).\*

by R. A. BLAKELOCK.

COMPOSITAE.

**Achillea aleppica** DC.

Arbil, 375 m., on waste land, large tufts spreading up fanwise from base, 21.4.32, 2163 ; Balad Sinjar, 402 m., on roadside grazing strip, 28.4.33, 4120 ; do.—Tal Afar, 330 m., on roadside strip of waste land, 28.4.33, 4150 ; Baba Gurgur, nr. Kirkuk, 360 m., 1.5.33, 4377.

**A. aff. callichroa** Boiss.

Baquba, Apr. 20, *Paranjpye* 91.

This specimen is much more slender in all parts than *A. callichroa* Boiss. The range of size in *A. callichroa* is unknown to me, since it is represented by only one specimen at Kew.

**A. conferta** DC.

Makatu nr. Mandali, May 1930, 866 ; Kirkuk Province, useful grazing plant, native name gaisum, 13.5.33, *Ali Effendi Hadari* 3934 ; Ghurfa Plain, nr. Injana (Jabal Hamrin), c. 120 m., on sandy soil, perennial of radial habit, 7.7.33, 4006.

**A. densa** *Blakelock* sp. nov. ; a *A. aleppica* DC. caulibus minus foliosis, corymbis densioribus et minoribus, capitulis submajoribus, floribus ochroleucis differt.

*Herba* perennis, multicaulis. *Radix* crassus, lignosus, collo caulium foliorumque pristinorum basibus persistentibus. *Caules* erecti vel ascendentes, simplices, angulato-sulcati ; caules floriferi foliis anthesi evanidis vel pauci,  $\pm$  albo-tomentosi, 19–33 cm. longi, 1–1.5 mm. lati ; caules steriles foliosi dense albo-tomentosi, 5–18 cm. longi. *Folia* radicalia parva, anthesi marcescentia, linearia, in segmentis transversis discretis vel  $\pm$  imbricatis margine spinuloso-partitis pinnatisecta, basi membranacea late ampliata, usque 1.5 cm. longa, c. 1 mm. lata ; folia caulina subteretia flexuosa, in segmentis transversis rotundatis laxa vel dense imbricatis margine spinulosis pinnatisectis,  $\pm$  albo-tomentoso in foliis junioribus segmentis tomento suboccultatis, 2–24 mm. longa, 1–1.5 mm. lata. *Corymbus* congestus, hemisphaeroideus, c. 1–2 cm. diam., 6–16-capitulatus, ramis crassis usque 2.5 mm. longis, pedunculis crassis 1–2 mm. longis, c. 1 mm. latis. *Capitula* oblongo-cylindrica, 6–7 mm. longa, 2–3 mm. lata. *Involucri bractearum* cymbiformes, obtusae, tomentosae, concolores. *Flores* ochroleuci (in sicco) ; ligulati pauci 4 mm. longi, ligulus 3-lobis, 2 mm. longis, c. 4 mm. latis ; tubulosi c. 3 mm. longi. *Cypselae* cylindrico-oblongae, subcompressae, striatae, 2 mm. longae, 1 mm. latae.

N. 'IRAQ. Dohuk, native name gulilk mish (K.), not considered important for grazing, 25.5.32, *E. R. Guest* 3244 (type) ; Zawita, 1005 m., on rocky bluff, 1.8.33, *E. R. Guest* 4959.

In *A. aleppica* DC. the corymbs are 2–5.5 cm. rarely 1.5 cm. diameter, and their longest branches are 5–40 mm. long. The flowers of *A. densa*

\*Continued from K.B. 1948, 444 (1949).

appear pale yellow, not golden as in *A. aleppica*. There is some doubt on this point, however, since only dried material has been seen.

*A. densa* may be distinguished from the description of *A. zederbaueri* Hayek by the taller stems, greyish leaves, narrower capitula and by the margins of involucre bracts being the same colour as the rest of the bract.

*A. albicaulis* C. A. M., *A. conferta* DC., *A. talagonica* Boiss. and *A. oxylepis* Boiss. differ from the species described here in the absence of sterile leafy shoots, and in having ovate or ovate-turbinate capitula.

### ***A. micrantha* MB.**

Kirkuk, 210 m., on the edge of a channel, not tufted, pls. growing singly, 16.4.32, 1987 ; Walash (nr. Razinook), Rowanduz Area, 1050 m., by a stream, flowers pale mustard yellow, 18.7.32, 2672 ; Chia-i-Mandali (nr. Walza), 1950 m., in a cornfield, 20.7.32, 2745 ; Tal Zalan (nr. Mosul), in a wheatfield, native name ward-adh-dhuban, 28.4.32, *Yusuf Lazar* 3350 ; Shaikh Adi, 900 m., 14.7.33, 3669.

### ***A. oligocephala* DC.**

Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4209 ; Baba Gurgur, 360 m., 1.5.33, 4378.

### ***A. santolina* L.**

Baghdad, along channels at Hinaidi, native name qaisum, 30.3.31, *Yusuf Lazar* 1158 ; Daltawa, in cultivated fields, 6.4.31, 1440 ; do., in an onion field, eaten by animals, 26.5.32, 2477 ; do., native name kaisum, 29.4.32, *Darwish Haidari* 2477A ; Baghdad, fields at Rustam, native name gaisum or shiah, 25.4.33, *Yusuf Lazar* 3888 ; Kirkuk Province, native name zifrah, 14.5.33, *Ali Effendi Hadari* 3955 ; Ain Ghazal (Mosul Province), 360 m., in a field, 28.4.33, 4087.

### ***A. vermicularis* Trin.**

Siah Koh (Kurdistan), 3000 m., on slopes in association with a blue *Mentha*, Aug. 1931, *Ludlow-Hewitt* 1508 ; Chia-i-Mandali, (nr. Walza), 1800 m., on the stony hillside, 18.7.32, 2660 ; Arl Gird Dagh, 2700 m., among rocks, 24.7.32, *Guest and Ludlow-Hewitt* 2952 ; do., 3000–3300 m., on rocky mountain side, 21.7.32 do., 3066 ; nr. Amadia, native name buizhan (K.), 1932, *Majid Mustafa*, 3607 ; Ser Amadia, 1800 m., on top of the ridge, 3.8.33, 4989.

### ***Anthemis feinbruniae* Eig. (det. N. Stojanoff et B. Achtaff).**

Nr. Amadia, native name girl rasai'ik (K.), 1932, *Majid Mustafa* 3602.

### ***A. haussknechtii* Boiss. et Reut. (det. N. S. Stojanoff et B. Achtaff).**

Acra, c. 450–900 m., native name kululkai kutha (K.), Mid.-Apr. 1932, 3093A.

The following two specimens have not been seen by Stojanoff and Achtaff.

Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4327 ; Kani Dolman Hills, 390 m., on a dry stony rounded hilltop, 30.4.33, 4329.

**A. aff. *hyalina* DC.**

Baqasra nr. Ain Sifni (Mosul), 375 m., native name baibun or kulilkah masata (K.), fodder plant, 10.6.32, *Salim Effendi* 2576 ; Jazira Desert, Mar.-Apr. 1933, *Edmonds* 3800 ; Arbil Province, grazed by animals, native name rubyan, Apr. -May 1933, *Mhd. al Rahdi* 3849 ; Ain Ghazal (Mosul Province), 360 m., in a field, 28.4.33, 4096 ; Balad Sinjar—Tal Afar, 330 m., on roadside strip of waste land, 28.4.33, 4139A.

The plants were returned by Stojanoff with an unpublished name on them. The following specimen was not seen by Stojanoff and Achtaroff, but probably belongs to the same species:

Felluja, Ain Ghuraib Estate, native name hodan, Mar. 1930, 1120.

**A. *odontostephana* Boiss. (det. N. Stojanoff et B. Achtaroff).**

Rowanduz Gorge, 410 m., on rocky ledges, cool shady situation, 17.4.32, 2034.

**A. *pseudocotula* Boiss. (det N. Stojanoff et B. Achtaroff).**

Rustam, in barley fields, 19.3.31, *Yussef Lazar* 1139 ; Hinaidi, 30.3.31 *do.* 1160 ; Dohuk, 450 m., in a cultivated field on dry gravel soil, 1.4.31, 1309 ; Qizil Robat, at edge of cornfield, 28.3.32, 1768 ; Acra, c. 450–900 m.?, native name kululkai kutka (K.), Mid-Apr. 31, *Qaimaqam of Acra* 3093 ; Dohuk, native name guli kashk, 12.5.32, *Mekki Beg*, 3281 ; Arbil Province, grazed by animals, native name ribyan, May 31, *Mhd.-al Radhi* 3865 ; Balad Sinjar—Tal Afar, 330 m., on roadside strip of waste, 28.4.33, 4139 ; Baghdad, in fields at Rustam, native name ward-al-futair, 25.4.33, *Yussef Lazar* 3897.

**A. *tinctoria* L.**

Arl Gird Dagħ (nr. Nawanda), 1800 m., by a stream, a clump of magnificent golden daisies, 21.7.32, 2868.

This number has been seen by Stojanoff and Achtaroff, who presumably passed it as this species as no correction is made on the sheets.

**A. *wettsteiniana* Hand-Mazz. (det. N. Stojanoff et B. Achtaroff).**

Jazira Desert, Mar.-Apr. 1933, *Edmonds* 3800A.

***Anthemis* sp.**

Daltawa, in a cornfield, native name babunaq or hankrais, 26.5.32, 2436.

The cypselae show some resemblance to those of *A. singarensis* Eig in Pal. Journ. Bot. ser. J., 1, 186, pl. VIII, f. 37 (1938), but the other characters do not agree with that species. The capitula in our plant are very small (5–6 mm. long, 3–4 mm. wide excluding rays). The involucre bracts are 1–2 mm. long. This has not been seen by Stojanoff and Achtaroff.

***Anthemis* spp.**

Qaraghan, on dry mud flats of the Diyala River, 30.3.32, 1890 ; Sulaimaniya, on daim (unirrigated) and watered land throughout the province, spring plant taken by all animals, 16.4.32, *Gowan* 2405.



**Arctium lappa L.**

Chia-i-Mandali (at Walash), 1200 m., in a hedge, 18.7.32, 2658 ; Zawita, 900 m., in gardens, native name 'urquah (K.), 27.7.33, 3759.

No. 3759 has smaller, more arachnoid heads than the rest of the Oriental material of this species in Herb. Kew. The petiole, however, is solid and the inflorescence corymbose.

**Artemisia campestris L.**

In the Jazira (nr. Wadi Tharthar), on open desert land, pleasant highly aromatic smell, native name salmas, 15.10.32, 3548 ; Hatra, growing on mounds among the ruins, 17.10.32, 3549.

**A. haussknechtii Boiss.**

Rowanduz Gorge (Kurdistan), 600 m., on rocks, 13.10.31, 1597.

**A. herba-alba Asso**

Makatu, nr. Mandali, May 1930, 872 ; Mandali, 150 m., reported to be very common on the hills, strong aromatic smell, used for making "laban" or curdled milk, also used for medicine, native name shiah or (in Kurdish) bokhoshkah, 26.3.32, 1712 ; Jazira Desert, Mar.-Apr. 1933, *Edmonds* 3799 ; Balad Sinjar, 429 m., on roadside pasture, 28.4.33, 4097.

**A. splendens Willd.**

Chia-i-Mandali, 2700 m., among rocks on the mountainside, 19.7.32, 2699.

**Artemisia sp.**

Ghurfa plain nr. Injana, Jabal Hamrin, sandy soil, perennial (often galled), 7.7.33, 4005.

This specimen shows only the vegetative parts.

**Bellis perennis L.**

Diana, nr. Rowanduz, 26.3.30, 706 ; Amadia, 1020 m., in valley orchards, 26.3.31, 1233.

**Calendula aegyptiaca Desf. (*C. ceratosperma* Viv.).**

Tuz, 210 m., in cultivated fields, 6.4.31, 1399.

Forma *carpica* II : *exalata longirostris* in Lanza's monograph (in Att. Reale Accad. Sc. Lett. B. Art. Palermo **12**, 1-166 (1923)).

**C. aegyptiaca Desf.**

Daltawa, along channels, 25.3.32, 1707.

This specimen belongs to forma *carpica* III : *exalata erostrata* (*C. microcephala* Kral.) according to the key in Lanza's monograph.

**C. arvensis L.**

Jabal Hamrin, nr. Injana, 29.3.30, 696.

This specimen does not show any florets, but the fruit shape distinguishes it from *C. persica* C. A. M. It belongs to Lanza's forma *carpica* V : *alata longirostris* (*C. stellata* Cav.).

**C. persica** *C. A. M.*

Jabal Hamrin, nr. Table Mountain, Feb. 1931, *Ludlow-Hewitt* 1074 ; Baghdad, in date gardens at Karada, 15.3.31, 1119 ; Dohuk, 450 m., 1.4.31, 1303 ; Arbil, 375 m., in cultivated fields, 2.4.31, 1459 ; Rustam, in barley fields, 19.3.31, *Yussef Lazar* 1512 ; Kirkuk Province, native name gulah zard, 14.5.33, *Ali Effendi Hadari* 3957.

These plants have yellow disc florets. The fruit are exalate erostrate, except some of the outer fruit of 1119, 1303 and 1512, which are more or less winged.

**C. persica** *C. A. M. ?*

Shargat (on mounds at Ashur), Mar. 1930, 394 ; Baghdad, in dry situation at the edge of paths in date gardens at Karada, Mar. 1931, 1119A.

These two gatherings have red disc florets, but leaves as wide as in *C. persica*. 1119A has exalate erostrate fruits ; 394 does not show any fruit.

**Carduus pycnocephalus** *L.*

Rustam, in barley fields, 19.3.31, *Yussef Lazar* 1146 ; Dohuk, c. 510 m., 1.4.31, 1321 ; Tuz Khurmatli, c. 210 m., along ditches in cultivated fields, 6.4.31, 1415 ; Mosul, c. 240 m., cultivated fields, near Nineveh, 2.4.31, 1488 ; Jabal Hamrin (nr. Table Mountain), 150 m., on sandy soil, 30.3.32, 1899 ; Baghdad, in an orchard at Karada, native name qulaghan, 13.4.32, 1952 ; Zakho Valley, 600 m., 25.4.32, 2266 ; Sulaimaniya, on daim land throughout the liwa, spring plant eaten by all animals, native name kalor, 21.4.32, 2407.

**Carthamus dentatus** *Vahl. (Kentrophyllum dentatum DC.).*

Nr. Zawita, 900 m., 10.10.31, 1657.

**C. flavescens** *Willd. (Kentrophyllum flavescens (Willd.) Tausch).*

Diana (nr. Rowanduz), c. 600 m., on the hillside, golden yellow, 25.7.32, 2988 ; Atrush (N. of Mosul), 900 m., stony hillside, 13.7.32, 3644.

**C. glaucus** *M.B. var. syriacus (Boiss.). Boiss. Fl. Or. 3, 707 (1875). (Kentrophyllum glaucum F. et M. var. syriacus (Boiss.) Boiss.).*

Batas (nr. Shaglaw), 750 m., on the stony hillside, 17.7.32, 3013 ; Atrush (N. of Mosul), Kurdistan, 900 m., common stony hillside, flowers white and pinkish mauve, 13.7.33, 3639.

**C. lanatus** *L.*

Mandali, 10.5.30, 893 ; Daltawa, on corn stubble near channels, erect yellow thistle, native name lisan-ath-thor (?), 26.5.32, 2468.

**C. oxyacantha** *M.B.*

Baghdad, common throughout 'Iraq and Persia, July 29, 178 ; Mandali, 9.5.30, 776 ; Badi nr. Dohuk, 825 m., on open hillside, 25.7.33, 4416.

**C. oxyacantha** *M.B. ?*

Daltawa, along channels in old cornfields, eaten by men when young, also by animals, native name sufair or ruwaitrah, 26.5.32, 2479.

Specimen too young for more accurate determination.

***Centaurea aggregata* F. et M.**

Arl Gird Dagħ (nr. Nawanda), 1200–2100 m., very common on the mountainside, 21.7.32, 2809.

***C. ammocyanus* Boiss.**

Jazira Desert, Mar.–Apr. 1933, *Edmonds* 3796.

***C. axillaris* Willd. var. *cana* (S. et S.) Boiss. Fl. Or. 3, 636 (1875).**

Amadia, 1020 m. in the valley orchards, flower blue, 26.3.31, 12.

***C. behen* L.**

Chia-i-Mandali (at Walash), 1200 m., at the edge of a field, tall erect plant about 3 ft. high, golden yellow flowers, 18.7.32, 2674.

***C. behen* L. var. *brachyptera* (DC) Boiss. Fl. Or. 3, 683 (1875).**

Mahad, nr. Shaikhān, very good fodder plant, native name *kakhort* (K.), 23.6.32, *Salim Effendi* 2607.

***C. cardunculus* Boiss.**

Rowanduz Gorge, 450–600 m., on the mountainside, 18.4.32, 2090.

***C. cyanus* L.**

Baghdad, alien, July 29, 186.

***C. aff. elegantissima* Bornm. e descr.**

Razinook (nr. Rowanduz), Kurdistan, c. 900 m., sweet-smelling, 10.5.33, *Cuckney* 3838.

This specimen appears intermediate between *C. persica* Boiss. and *C. elegantissima* Bornm. It differs from the description of *C. elegantissima* in the involucral bracts being yellowish, sometimes slightly tinged with purple (not pink or purple) and having about 14 cilia on each side (not 4–5). It differs from *C. persica* Boiss. in the larger capitula, and in the terminal lobe being no larger than the lateral ones in the lower leaf.

***C. iberica* Trev.**

Mandali, 9.5.30, 767 ; Daltawa, along channels in old cornfields, native name *kassur*, 26.5.32, 2467 ; Jabal, E.N.E. of Seri Hassan Beg, 1800–2100 m., very common on barren lands near fields, etc., purple thistle, 24.7.32, 2906.

***C. iberica* Trev. ?**

Baghdad (in cultivated field at Harathiya), 24.2.31, 448 ; Felluja, cultivated land, native name *kassub*, 6.3.30, 964 ; Mandali, in a cornfield, native name *marair* or *chalbah*, 26.3.32, 1804 ; Kirkuk, 300 m., in a cornfield, 16.4.32, 1985.

Material too young for determination.

***C. foveolata* Blakelock** sp. nov. [Sect. *Acrolophus* (Cass.) DC.] ; a *C. damascena* Boiss. habitu, caulibus glabris foliosis et involucri bracteis acutis (haud obtusis retusis) distinguitur.

*Radix* lignosa, crassa, perennis, pluriceps. *Caules* graciles, angulato-sulcati, in sulcis foveolati, glabri, 36–52 cm. alti, superne ramosi ramis



subsimplicibus, gemmis axillaribus dense albo-lanatis. *Folia* radicalia anthesi evanida; folia caulina foveolata, subscabrida; inferiora lyrato-pinnatifida, 4-5 cm. longa, foliolis terminalibus spathulato-lanceolatis integris vel paucidentatis 2-3 cm. longis, 0.3-0.6 cm. latis, segmentis lateralibus linearibus integris 0.2-1 cm. longis, c. 0.1 cm. latis; folia caulina superiora linearia integra sensim diminuta, 1-4 supra ut pedunculi saepe  $\pm$  albo-lanata. *Capitula* ovata, c. 1.5 cm. longa, c. 1.2 cm. lata. *Involucri bractee* extimae appendicibus ceterorum similes, 2-5 mm. longae; intermediae oblonga-ovatae, convexae, 4 mm. longae, 2 mm. latae, appendicibus subpatentibus ovatis acutis mediis pallide fuscis margine albo-membranaceis ciliato-laceris vel erosis 7 mm. longis (setis inclusis) 4 mm. latis, ciliis lateralibus usque 1 mm. longis, setis terminalibus 2-3 mm. longis; intimae lineares 6 mm. longae, 1 mm. latae, appendicibus minoribus lanceolatae. *Flores* roseae vel purpureae (in sicci), haud radiantes, corolla c. 10 mm. longa. *Cypselae* cylindrico-turbinatae, parce pubescens, 2-3 mm. longa, c. 1 mm. lata. *Pappi* series intermedia 4 mm. longa, extima intimaque breviora.

N. 'IRAQ. Amadia, Kurdistan, 1200 m., by a millstream at Sulaf, 2.8.33, E. R. Guest 3769; do., c. 1500 m., on rocks in Mazurka Gorge above Sulaf, 2.8.33, do. 3773 (type).

Like *C. dan ascensae* Boiss., this species appears to be intermediate between section *Acrolophus* (Cass.) DC. and section *Phalolepis* (Cass.) DC. In section *Phalolepis* the species most like *C. foveolata* is *C. aphrodisaea* DC. This differs from *C. foveolata* in the dense white indumentum and in the obtuse wider appendages on the involucre bracts.

**C. fusiformis** *Blakelock* sp. nov. [Sect. *Acrolophus* (Cass.) DC.]; a *C. leptoccephala* Boiss. e descr. involucri bractearum appendicibus apice adpressis cypselis hirsutis differt.

*Radix* lignosa, crassa, perennis, pluriceps. *Caules* graciles, angulato-sulcati, sulcis foveolatis  $\pm$  tomentosis, costis glabris, basi dense tomentosi, 22-52 cm. alti, ramosi. *Folia* radicalia anthesi saepe evanida; folia radicalia et caulina inferiora glabrescentia vel tomentosa, foveolata, petiolata, 4-6 cm. longa (petiolis incl.), lyrata vel indivisa, segmentis terminalibus spathulato-lanceolatis vel ellipticis, integris vel paucidentatis, 1.5-3 cm. longis, 0.3 cm. 1 cm. latis, segmentis lateralibus 1-2-jugis, linearibus vel oblongis 0.2-0.6 cm., c. 0.1 cm. latis; folia caulina superiora linearia vel lineari-spathulata, integra, sessilia, sensim diminuta, glabrescentia vel tomentosa. *Capitula* fusiformia, basi valde angustata apice minus angustata, 12 mm. longa (floribus exclusis), 3 mm. lata, 4-6-fl. *Involucri bractee* apice adpressae extra sparse tomentosae; extimae ovato-lanceolatae pallide brunneae c. 2 mm. longae, c. 1 mm. latae, margine ciliata praecipue apicem versus ciliis albo-membranaceis c. 0.75 mm. longis; intermediae lanceolatae apice acutae convexae, pallide brunneae 4-7 mm. longae, 1.5 mm. latae, margine basin versus integra albo-membranacea apicem versus ciliata, ciliis albo-membranaceis, usque 1 mm. longis, cilio terminali pallide brunneo quam ceteris haud longiore; intimae lineares apice acutae ciliato-lacerae, 6 mm. longae, c. 1 mm. latae, margine integra albo-membranacea. *Flores* 2-3 mm. exserti, haud radiantes; corolla c. 11 mm. longa. *Cypselae* truncato-ellipsoideae, sparse hirsutae nitens laete brunnea pallide striata, 3.5 cm. longa, 1.5 mm. lata, pappo albo, 2 mm. longo.

***Centaurea aggregata* F. et M.**

Arl Gird Dagh (nr. Nawanda), 1200–2100 m., very common on the mountainside, 21.7.32, 2809.

***C. ammocyanus* Boiss.**

Jazira Desert, Mar.–Apr. 1933, *Edmonds* 3796.

***C. axillaris* Willd. var. *cana* (S. et S.) Boiss. Fl. Or. 3, 636 (1875).**

Amadia, 1020 m. in the valley orchards, flower blue, 26.3.31, 12.

***C. behen* L.**

Chia-i-Mandali (at Walash), 1200 m., at the edge of a field, tall erect plant about 3 ft. high, golden yellow flowers, 18.7.32, 2674.

***C. behen* L. var. *brachyptera* (DC) Boiss. Fl. Or. 3, 683 (1875).**

Mahad, nr. Shaikhan, very good fodder plant, native name *kakhort* (K.), 23.6.32, *Salim Effendi* 2607.

***C. cardunculus* Boiss.**

Rowanduz Gorge, 450–600 m., on the mountainside, 18.4.32, 2090.

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Baghdad (in cultivated field at Harathiya), 24.2.31, 448 ; Felluja, cultivated land, native name *kassub*, 6.3.30, 964 ; Mandali, in a cornfield, native name *marair* or *chalbah*, 26.3.32, 1804 ; Kirkuk, 300 m., in a cornfield, 16.4.32, 1985.

Material too young for determination.

***C. foveolata* Blakelock** sp. nov. [Sect. *Acrolophus* (Cass.) DC.] ; a *C. damascena* Boiss. habitu, caulibus glabris foliosis et involucri bracteis acutis (haud obtusis retusis) distinguitur.

*Radix* lignosa, crassa, perennis, pluriceps. *Caules* graciles, angulato-sulcati, in sulcis foveolati, glabri, 36–52 cm. alti, superne ramosi ramis

subsimplicibus, gemmis axillaribus dense albo-lanatis. *Folia* radicalia anthesi evanida; folia caulina foveolata, subscabrida; inferiora lyrato-pinnatifida, 4-5 cm. longa, foliolis terminalibus spathulato-lanceolatis integris vel paucidentatis 2-3 cm. longis, 0.3-0.6 cm. latis, segmentis lateralibus linearibus integris 0.2-1 cm. longis, c. 0.1 cm. latis; folia caulina superiora linearia integra sensim diminuta, 1-4 supra ut pedunculi saepe  $\pm$  albo-lanata. *Capitula* ovata, c. 1.5 cm. longa, c. 1.2 cm. lata. *Involucri bractearum* extimae appendicibus ceterorum similes, 2-5 mm. longae; intermediae oblonga-ovatae, convexae, 4 mm. longae, 2 mm. latae, appendicibus subpatentibus ovatis acutis mediis pallide fuscis margine albo-membranaceis ciliato-laceris vel erosio 7 mm. longis (setis inclusis) 4 mm. latis, ciliis lateralibus usque 1 mm. longis, setis terminalibus 2-3 mm. longis; intimae lineares 6 mm. longae, 1 mm. latae, appendicibus minoribus lanceolatae. *Flores* rosea vel purpurei (in sicci), haud radiantes, corolla c. 10 mm. longa. *Cypselis* cylindrico-turbinata, parce pubescens, 2-3 mm. longa, c. 1 mm. lata. *Pappi* series intermedia 4 mm. longa, extima intimaque breviora.

N. 'IRAQ. Amadia, Kurdistan, 1200 m., by a millstream at Sulaf, 2.8.33, E. R. Guest 3769; do., c. 1500 m., on rocks in Mazurka Gorge above Sulaf, 2.8.33, do. 3773 (type).

Like *C. dan ascena* Boiss., this species appears to be intermediate between section *Acrolophus* (Cass.) DC. and section *Phalolepis* (Cass.) DC. In section *Phalolepis* the species most like *C. foveolata* is *C. aphrodisea* DC. This differs from *C. foveolata* in the dense white indumentum and in the obtuse wider appendages on the involucre bracts.

**C. fusiformis** *Blakelock* sp. nov. [Sect. *Acrolophus* (Cass.) DC.]; a *C. leptoccephala* Boiss. e descr. involucri bractearum appendicibus apice adpressis cypselis hirsutis differt.

*Radix* lignosa, crassa, perennis, pluriceps. *Caules* graciles, angulato-sulcati, sulcis foveolatis  $\pm$  tomentosis, costis glabris, basi dense tomentosi, 22-52 cm. alti, ramosi. *Folia* radicalia anthesi saepe evanida; folia radicalia et caulina inferiora glabrescentia vel tomentosa, foveolata, petiolata, 4-6 cm. longa (petiolis incl.), lyrata vel indivisa, segmentis terminalibus spathulato-lanceolatis vel ellipticis, integris vel paucidentatis, 1.5-3 cm. longis, 0.3-1 cm. latis, segmentis lateralibus 1-2-jugis, linearibus vel oblongis 0.2-0.6 cm., c. 0.1 cm. latis; folia caulina superiora linearia vel lineari-spathulata, integra, sessilia, sensim diminuta, glabrescentia vel tomentosa. *Capitula* fusiformia, basi valde angustata apice minus angustata, 12 mm. longa (floribus exclusis), 3 mm. lata, 4-6-fl. *Involucri bractearum* apice adpressae extra sparse tomentosae; extimae ovato-lanceolatae pallide brunneae c. 2 mm. longae, c. 1 mm. latae, margine ciliata praecipue apicem versus ciliis albo-membranaceis c. 0.75 mm. longis; intermediae lanceolatae apice acutae convexae, pallide brunneae 4-7 mm. longae, 1.5 mm. latae, margine basin versus integra albo-membranacea apicem versus ciliata, ciliis albo-membranaceis, usque 1 mm. longis, cilio terminali pallide brunneo quam ceteris haud longiore; intimae lineares apice acutae ciliato-lacerae, 6 mm. longae, c. 1 mm. latae, margine integra albo-membranacea. *Flores* 2-3 mm. exserti, haud radiantes; corolla c. 11 mm. longa. *Cypselis* truncato-ellipsoidea, sparse hirsuta nitens laete brunnea pallide striata, 3.5 cm. longa, 1.5 mm. lata, pappo albo, 2 mm. longo.



N. 'IRAQ. Dohuk, 450 m., 10.10.31, *E. R. Guest* 1589 (type); Zawita Gorge, on limestone rocks, 480 m., 26.7.33, *do.* 3729; Zawita, 1110 m., in pine forests on rocky limestone slope, 27.7.33, *do.* 4500; *do.*, 1170 m., 28.7.33, *do.* 4564; *do.*, 1140 m., 29.7.33, *do.* 4724; *do.*, 1065 m., in pine forest on limestone crags, 30.7.33, *do.* 4765; *do.*, 1020 m., in pine forest, 30.7.33, *do.* 4828; *do.*, 990 m., on rocky cliff near the village, 30.7.33, *do.* 4839; *do.*, 1035 m., on steep limestone slope, 1.8.33, *do.* 4930.

This species differs from most of the section *Acrolophus* in the very narrow capitula. It is clearly distinguished from *C. foveolata* described above by the smaller capitula with adpressed more regularly ciliate appendages, with the terminal cilia not longer than the others, and by other characters.

**C. gigantea** *Sch.-Bip.*

Amadia, Kurdistan, Mazurka Gorge, c. 1500 m., 2.8.33, 3781.

**C. pallescens** *Del.* var. **hyalolepis** *Boiss.* Fl. Or. 3, 691 (1875).

Mandali, 9.5.30, 903; nr. Zawita, N. of Dohuk (Kurdistan), 900 m., at the edge of a rice field, 10.10.31, 1568.

**C. persica** *Boiss.*

Arl Gird Dag, 1800 m., by a stream, purple, 21.7.32, 2849.

**C. phyllocephala** *Boiss.*

Baghdad, July 1929, 177; nr. Mandali, Ab-i-Naqt River, 9.5.30, 902.

**C. rigida** *Banks et Sol.* (*myriocephala* *Sch. Bip.*) var. **erythracantha** (*Bornm.*) comb. nov.; ex Nábělek in Publ. Fac. Sci. Univ. Masaryk 52, 43 (1925).

Arbil, 375 m., in a cornfield on red loam, 20.4.32, 2127.

**C. rigida** *Banks et Sol.* f. **schizophylla** (*Náb.*) comb. nov. e descr.

Mandali, 10.5.30, 881; Ain Ghazal (Mosul Province), 360 m., in a field, 28.4.33, 4068; Balad Sinjar, 429 m., on roadside grazing land, 28.4.33, 4098; Balad Sinjar-Tal Afar, 330 m., on roadside strip of waste land, 28.4.33, 4145.

*C. schizophylla* Nábělek has already been reduced to a form of *C. myriocephala* *Sch. Bip.* by Bornmüller in Fedde Rep. 24, 372 (1928) & Beih. Bot. Centralbl. 60, abt. B, 213 (1939).

**C. rigida** *Banks et Sol.* var. ?

Naft Khana, 150 m., on stony hillside, 29.3.32, 1846.

This specimen shows only immature heads and the branches of the inflorescence.

**C. sessilis** *Willd.*

Arl Gird Dag, 3300 m., on a rocky plateau, 22.7.32, 2881.

The leaves are less lyrate than in most specimens of this species in Herb. Kew, but match those of Aucher-Eloy's specimen (No. 4851) from Aderbidjan (Azerbaijan).

**C. solstitialis** L.

Daltawa, along channels in old cornfields, native name daraidara or kassub, 26.5.32, 2465 ; Arl Gird Dagħ, 1800 m., very common on the hillside, golden yellow, 21.7.32, 2823.

**C. tomentella** Hand.-Mazz. e descr.

Chia-i-Mandali (nr. Walash), 1050 m., on the hillside among scrub oak, pale purplish flowers, 18.7.32, 2673.

Very close to *C. gigantea* Sch.-Bip., from which it differs in the pale purplish flowers, and the 6-8 (not 4-6) pairs of pectinations on the appendage of the involucre bracts.

Our plant appears intermediate in the length of the peduncles and of the spines of the involucre bracts between *C. imperialis* Bornm. and *C. chaldaeorum* Nábělek (e descr. et fig.), but the appendages are narrower than in either of these species.

**C. virgata** Lam. var. **squarrosa** (Rottl.) Boiss. Fl. Or. 3, 651 (1875).

Walash-Walza (Rowanduz Area), 1200-1800 m., on stony hillside, very common, 18.7.32, 2671 ; Atrush, 885 m., on red marl slopes in open pine forest, 13.7.33, 3633 ; Zawita, 1200 m., on stony plateau, 28.7.33, 4581 ; do., 1080 m., in pine forest on steep rocky slope, 28.7.33, 4634.

**Chardinia orientalis** (L.) O. Kuntze (*C. xeranthemoides* Desf.).

Jabal Hamrin (nr. Table Mountain), 150 m., on dry sandy soil, 30.3.32, 1902 ; Rowanduz Gorge, 600 m., on a grassy slope on the mountainside, 20.4.32, 2143 ; Zawita nr. Dohuk, 900 m., on high slopes of the gorge, 23.4.32, 2197 ; Dohuk, 450 m., in a cornfield, 23.4.32, 2322 ; Mosul, on a hill, 23.4.32, *Yussef Lazar* 3385 ; Acra, c. 450-900 m. ?, native name banishtuk (K.), *Qaimaqam of Acra* 3085 ; Kani Dolman hills, 390 m., on dry stony rounded hilltop, 30.4.33, 4332.

**Chondrilla juncea** L.

Atrush valley, on sandy flats in bed of the Rubal Atrush, 600 m., flowers yellow, 14.7.33, 3661.

**Chrysophthalmum montanum** (DC.) Boiss.

Amadia, Kurdistan, c. 1500 m., on rocks in Mazurka Gorge, 2.8.33, 3775.

**Cichorium intybus** L.

Rustam, a common weed, especially in clover fields, 2.5.31, *Yussef Lazar* 1171 ; Chia-i-Mandali, 1950 m., in a cornfield, 20.7.32, 2746 ; Zawita Gorge, 840 m., on rocky slope, 26.7.32, 3718.

In 1771 the pappus is much reduced, almost absent.

**C. noeanum** Boiss.

Ba'adhara (nr. Shaikhan), good food plant, native name tahlah shir (K.), 19.6.32, *Salim Effendi* 2599 ; Kirkuk Province, useful grazing plant, also kneaded with oil and used for skin diseases as an unguent, native name chaqchaqah, 14.5.33, *Ali Effendi Hadari* 3945.

**C. pumilum** Jacq. (*C. divaricatum* Schousb.).

Mandali, 9.5.30, 783 ; Daltawa, on corn stubble, native name tojaij, 26.5.32, 2464 ; do., eaten by sheep and horses, 22.4.32, *Darwish Haidari* 2466A.

Some of these much resemble *C. noëanum*.

**Cichorium** sp.

Rustam, Mar. 29, 268A ; Tal Kaif, c. 300 m., found occasionally on the plains, useful for sheep grazing, native name mudha'af, Apr.–May 32, *Mudir of Tal Kaif* 3175.

Near *C. intybus* L., but too young to show any fruits.

**Cirsium elodes** MB.

Rowanduz Gorge, 600 m., 12.10.31, 454.

**C. aff. lappaceum** (MB.) Fisch.

Ser Amadia, 1800 m., on top of the ridge, 3.8.33, 4985.

This gathering shows only immature capitula. It matches two specimens in Herb. Kew. ("Nestorian Mountains and Gawar, 1857, *Garden*" and "Nowdere, b. Sultanabad, 10.5.1890, *Strauss*"), both of which show flowering heads. This form differs from the described varieties of *C. lappaceum* in the smaller less globose capitula (2 cm. long, c. 1 cm. wide) with the spines of the involucre bracts subpatent and erect. Possibly this is the same form described by Nábélek (in Publ. Fac. Sc. Univ. Masaryk **52**, 33 (1925)). The capitula rather resemble those of *C. bracteosum* DC. (e.g. "Persia, *Aucher-Eloy* 3529" and "in monte Ararat, *Szowits*") and our plant may be a hybrid between *C. lappaceum* and *C. bracteosum*.

**C. libanoticum** DC.

Chia-i-Mandali, 2100 m., by a stream, purple thistle, 19.7.32, 2736.

**Codonocephalum inuloides** Fenzl.

Atrush, 885 m., on red marl banks in a pine forest, orange yellow flowers, 13.7.33, 3630 ; Zawita Valley, 825 m., on red marl banks, 25.7.33, 4436 ; do., 870 m., do., 1.8.33, 4883.

**Cousinia baueri** Bornm. et Nábélek e descr. in Oest. Bot. Zeit. **63**, 61 (1913).

Zawita-Suwara Tukka, 1050 m., 23.4.32, 2208 ; Zawita Gorge, 840 m., on rocky slope, 26.7.33, 3715.

2208 is too immature to be identified with certainty, but it is probably this species.

**C. cymbolepis** Boiss.

Jabal, E.N.E. of Seri Hassan Beg, 1950 m., on the stony hillside, 24.7.32, 2907 ; Ser Amadia, 1770 m., on mountain slope, 3.8.33, 4981.

**C. cynaroides** (M.B.) C.A.M. var. **arlgirdensis** Blakelock var. nov.

A typo planta 30–35 cm. alta (haud 20–25 cm.), foliis spinosioribus, involucri bracteae densius araneosis differt.



Arl Gird Dagħ, 2700 m., among rocks, flowers white, 24.7.32, *E. R. Guest* 2951.

The indumentum on the involucre is generally dense enough to hide the bases of the appendages, and makes the capitula appear more bulky than they are.

**C. aff. *ottonis* Bornm. e descr.**

Chia-i-Mandali (nr. Walza), 1800–2100 m., on the hillside, purple thistle 2–3 ft. high, 19.7.32, 2735.

Our plant differs from *C. ottonis* in having a glandular pilose stem, narrower involucre bracts, and purple flowers. This is probably a new species, but since the lower part of the plant is missing, and as it is only represented by one gathering, I hesitate to describe it as new here.

This specimen also resembles *C. oreodoxa* Bornm. et Sint. (Transcaspia : Aschabad, Suluklū, 30.7.00, *Sintenis* 1000). *C. oreodoxa* has less lobed and less spiny upper cauline leaves as well as differing in other characters.

**C. *stenocephala* Boiss.**

Arbil, 740 m., on stony red loam in cultivated fields (fallow), 17.7.32, 3002 ; Atrush (N. of Mosul), 900 m., stony hillside, 13.7.33, 3643 ; nr. Altun Kopri on Zab River, 210 m., edge of field below conglomerate hills, 8.7.33, 4029 ; Balad Sinjar, 429 m., on roadside grazing strip, 28.4.33, 4101 ; Balad Sinjar, 330 m., on roadside strip of waste land, 28.4.33, 4143 ; do., 330 m., on semi-natural steppe, 28.4.33, 4192 ; Kani Dolman hills, Kirkuk, 390 m., on dry rounded stony hilltop, 30.4.33, 4288, 4364.

**Crepis *aspera* L.**

Daltawa, 26.5.32, 2483.

**C. foetida** L. subsp. **commutata** (Spreng.) Bab. The Genus *Crepis* Part II, 697 (1947). (*Rodigia commutata* Spreng.).

Shaikhan (nr. Mosul), on flat "daim" land near water, native name gul likah zar (K.), 5.6.32, *Salim Effendi* 2547 ; Tal Kaif, c. 300–600 m., occasionally found in the hills and on the plain, bad for sheep, causes their death, native name hodhan, Apr. –May 32, *Mudir of Tal Kaif* 3198 ; Dohuk, when green gives sheep a fever from which they may eventually die if they continue eating it, native name kalik zar, 5.5.32, *Mekki Beg* 3272 ; Kani Dolman hills, Kirkuk, 390 m., on dry stony rounded hilltop, 30.4.33, 4342.

The plants of 2547 are much depauperate. The smallest plant is c. 10 cm. high and bears only one capitulum.

This subspecimen is not recorded from 'Iraq by Babcock, who, however cites specimens from Turkey, Syria and Persia.

**C. *parviflora* Desf.**

Daltawa, in a cornfield, native name marair or ward-al-futir, 26.5.32, 2435 ; do., stems eaten by sheep but the leaves are bitter, 29.4.32, 2340 ; do., 26.5.32, 2462.

**C. sancta** (L.) Bab. subsp. **bifida** (Vis.) Thell. see Babcock The Genus *Crepis*, Univ. Calif. Publ. Bot. 22, part II, 736 (1947).

Jabal Darawishka (nr. Khanaqin), 240 m., on the stony hillside, 28.3.32, 1759 ; Qaraghan, along the dry edge of a cornfield on bare stony soil, 30.3.32, 1880 ; Arbil Province, native name rubyan asfar, grazed by animals, May 1933, *Mhd. al Rahdi* 3872 ; Ain Ghazal (Mosul Province), 360 m., in a field, 28.4.33, 4095 ; Balad Sinjar, 402 m., on roadside grazing strip, 28.4.33, 4114 ; Balad Sinjar-Tal Afar, 330 m., on roadside strip of waste land, 28.4.33, 4127 ; do., on semi-natural steppe, 28.4.33, 4186 ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4212 ; Makhlat, 180 m., on open *Stipa* steppe, native name hodhan, 29.4.33, 4247.

**C. sancta** (L.) Bab. subsp. **nemausensis** (Gouan) Thell.

Amadia, 1050 m., 27.3.31, 1251 ; Rowanduz Gorge, 750 m., with *Galium kurdicum*, 18.4.32, 2115A.

**Crupina crupinastrum** (Moris) Vis. ?

Badi, nr. Dohuk, 825 m., on open hillside, 25.7.33, 4425.

This specimen shows only old capitula from which the achenes have been shed.

**Cynara auranitica** Post (*kurdica* Hand.-Mazz.) e descr.

Nr. Ain Sifni, 450 m., hillside, pastures, fields, etc., brilliant blue with brilliant reddish-purple bracts, 12.7.33, 4040.

*C. kurdica* is reduced by Bornmüller to a synonym in Fedde, Rep. **24**, 370 (1928).

**Dipterocome pusilla** F. et M.

Tursak nr. Mandali, at edge of a cornfield, 26.3.32, 1739.

**Doronicum** sp. (Subsect. *Macrophylla* Cavill.).

Arl Gird Dagħ (nr. Rust), 2250 m., by a stream, bright yellow, 24.7.32, *Guest and Ludlow-Hewitt* 2928.

The length and amount of glandular indumentum on the surface of the involucre bracts varies considerably in the two specimens under this number. In one of our specimens it is dense, and in the other shorter and sparser ; in neither could it be described as " fere glabra", as in *D. haussknechtii* Cavill. e descr.

In our plant, as in *D. haussknechtii*, the involucre bracts are fringed with macropodial glands.

The smaller bracts of the general inflorescence are glandular-pilose, but the larger cauline leaves (up to 20 cm. long, 14 cm. wide) are almost glabrous even on the margins. This last character distinguishes it from any species in this subsection mentioned by Cavillier in Ann. Conserv. Jard. Bot. Geneve **13** and **14**, 195-368 (1909-11). As the rhizome and radical leaves are missing 2928 is not more accurately determined here.

**Echinops bicolor** Nábelek e descr.

Rowanduz Gorge, 600 m., on the mountain side, beautiful mauvish blue, 25.7.32, 2987.

**Echinops blancheanus Boiss.**

Tuz Khurmatli, 210 m., in cultivated fields, 6.4.31, 1416 ; Daltawa, along channels in old cornfields, eaten by animals and by men when young, dried for fodder, native name haisharan, 26.5.32, 2469 ; nr. Batas, 750 m., on the stony hillside, very beautiful bluish-mauve flowers, 17.7.32, 3014.

1416 is too immature for accurate determination, but it appears to belong to this species.

**E. aff. blancheanus Boiss.**

Nr. Kirkuk, Kani Dolman hills, 360 m., on sandy soil, 16.4.32, 2002 ; Baba Gurgur, nr. Kirkuk, 300 m., alluvial soil on sandstone bluff, 8.7.33, 4009.

These have much less deeply dissected leaves than the rest of the material of *E. blancheanus*, but as the leaf-shape varies considerably in the syn-type material, our plants are probably not distinct.

**E. horridus Desf.**

Zawita, 1200 m., on rocky plateau, 28.7.33, 4585 ; Ser Amadia, 1770 m., 3.8.33, 4978.

**E. aff. tournefortii Ledeb.**

Arl Gird Dag, 2550 m., on the stony hillside, 24.7.32, *E. R. Guest*, 2937.

Guest's material consists of two plants, both of which are unbranched 30 cm. and 19 cm. high and the capitula are 6.5 cm. and 5 cm. in diameter respectively. The cauline leaves are undivided. The radical leaves and one of the lowermost cauline leaves, are pinnatisect as in the typical form. The collar of the stem is densely clad by the persistent fibrous dead leaf-bases. The small size and unbranched stem distinguish it from *E. tournefortii*.

Four other specimens, not in the Rustam Herbarium, should be compared with 2937 : Taurus, *Kotschy* (Herb. Kew) ; Taurus Armenus, mons Harefta supra vicum Baraspi, inter Başkala et Koçânes, in herbidis, c. 2600 m., 1.9.10, *Nábělek* 3651 ; Vil. Antalya (Lycia), Tahtali dağ above Kemer, 2000-2200 m., 17.8.47, *P. H. Davis* 14156 ; Vil. Muğla (Lycia) Baba dağ above Akbel yaylâ (above Fetliye), 1500-1650 m., 30.7.47, *do.* 13651.

*Nábělek*'s specimen I have not seen. It is, however, described (without being given a definite name) by him in Publ. Fac. Sci. Univ. Masaryk **52**, 27 (1925). The stem is branched and about 1.2 m. high. In the typical form the stem is branched and up to 1.5 m. (*Bot. Mag.* 8217).

I understand that *Davis*' specimens are being described elsewhere.

**E. viscosus DC.**

Atrush (N. of Mosul), 900 m., stony hillside, 13.7.33, 3646.

In leaf shape and indumentum this specimen shows a marked resemblance to *E. ceratophorus* Boiss. var. *virens* Boiss, from which, however, it differs in the glands on the outer bracts of the partial involucre.



**Echinops** sp.

Balad Sinjar, 402 m., on roadside grazing strip, 28.4.33, 4123.

This specimen shows only leaves and root.

**Eclipta alba** (L.) Hassk.

Karada, nr. Baghdad, on sandy dunes left by receding river, 8.10.30, 1038 ; Aziziya, in a *Sorghum* field, native name barkaijah (?), 17.9.32, 3473 ; Kut, along the river's edge, native name arandis, 15.9.32, *Yussef Lazar* 3485 ; Diyala River at Rustam, common on mud flats left by receding river in autumn, 24.9.32, 3509 ; Um-al-Banni (Kut), on the river bank, native name sanaislah (?), 6.10.32, 3578.

**Erigeron amorphoglossum** Boiss.

Siah Koh (Kurdistan), 3510 m., on the very top of the mountain, Aug. 31, *Ludlow-Hewitt* 1510 ; Arl Gird Dagħ, 3300 m., 22.7.32, *Guest and Ludlow-Hewitt* 2886.

**Erigeron canadensis** L.

Kut, Sept. 1929, 211 ; Rustam, common in grassy places under trees, 29.11.31, 481 ; Baghdad, on sandy banks of the Tigris at Karada, Mar. 31, 1125.

No. 1125 is a stunted form with a very woody base to the stem, probably the result of grazing over a number of years.

**Eupatorium cannabinum** L.

Rowanduz Gorge (Kurdistan), 600 m., near the stream, 12.10.31, 453 ; do., 600 m., on rocky cliff, 25.7.32, 2980.

**E. cannabinum** L. var. **indivisum** DC. Prod. **5**, 180 (1836).

Rowanduz Gorge, 600 m., on banks of stream, 12.10.31, 486.

**E. syriacum** Jacq.

Amadia, 1200 m., by a millstream at Sulaf, 2.8.33, 3767.

**Evax anatolica** Boiss. et Heldr.

Tuz, at the edge of a cornfield on dry barren patches of soil, 16.4.32, 1979 ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4207 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4188A ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4222A.

**Filago spathulata** Presl.

Nr. Mahmudiya (Latifiya Estate), on channels in lucerne plots, 16.5.32, 2388 ; Daltawa, in an onion field, eaten by animals, 26.5.32, 2486 ; Arbil Province, grazed by animals, native name kutainah, May 1933, *Mhd. al Radhi* 3869 ; Makhlat, 180 m., on open *Stipa* steppe, 29.4.33, 4246 ; do., 165 m., among rocks under small cliff, 29.4.33, 4269.

**Filago spathulata** Presl. var. **prostrata** (Parl.) Boiss. Fl. Or. **3**, 246 (1875).

Tuz, 210 m., at the edge of a cornfield on dry bare patches of soil, 16.4.32, 1978 ; Tauq Chai (nr. Kirkuk), 16.4.32, 1981 ; Kirkuk Pro-

vince, excellent grazing plant, native name kutainah, 13.5.33, *Ali Effendi Hadari* 3930 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4189 ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4223.

There is no sharp distinction in habit between this and the typical form.

***Francoeuria crispa* (Forsk.) Cass.**

Baghdad, July 1929, *Rogers* 179 ; Kut, Sept. 1929, 198 ; Oja (?) canal nr. Ctesiphon, Oct. 1930, 1036 ; Rustam, 4.5.31, *Yussef Lazar* 1182 ; Bada (N. of Baghdad), on sandy loam in vegetable gardens, eaten by sheep, native name jifjaf, 26.5.32, 2509 ; Aziziya, in a *Sorghum* field, 6.10.32, 3568.

***Garhadiolus hedypnois* (F. et M.) Jaub et Spach.**

Rowanduz Gorge, 750 m., on the mountainside, 18.4.32, 2105 ; do., with *Galium kurdicum*, 2115B ; Dohuk, 450 m. in a cornfield, 25.4.32, 2296 ; Daltawa, in an onion field, 26.5.32, 2484 ; Arbil Province, grazed by animals, native name khamishah, May 33, *Mhd. al Rahdi* 3868 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4190 ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4238 ; Makhlat, 180 m., on open *Stipa* steppe, 27.4.33, 4241 ; Kani Dolman hills, Kirkuk, 390 m., on dry rounded stony hilltop, 30.4.33, 4336 ; Ghurfa plain (nr. Daltawa), in a depression previously cultivated, 12.8.33, *Guest. Eig and Zohary* 5075.

***Geropogon glabrum* L.**

Daltawa, in cornfields, flower pinkish-mauve, green immature flowering shoots are eaten by horses and animals also by mankind, native name dhanab-al-faras or zabib-al-khail, 29.4 & 26.5.32, *Guest and Darwish Haidari* 2437 ; Mahad (nr. Shaikhan), harmful to sheep and causes death in spring (when green), native name shaddanak (K.), 24.7.32, *Salim Effendi* 2618 ; Dohuk, in the hills and valleys, native name aspink (K.), 25.5.32, *Mekki Beg* 3249.

***Gundelia tournefortii* L.**

Mosul-Dohuk, c. 300 m., 1.4.31, 1278.

This plant has rather wider leaves, with more thickened spines than the specimens below.

***G. tournefortii* L. f. *purpurascens* Bornm.** in Beih. Bot. Centralbl. 60, abt. B, 197 (1939).

Khanzad Valley (nr. Arbil), c. 450 m., in a cornfield, flower yellow, 17.4.32, 2011 ; Rowanduz Gorge, 450 m., flower bright mauve, 17.4.32, 2036.

Despite the field note "flower yellow" the florets of 2011 are decidedly tinged with purple.

***G. tournefortii* L. var.**

Kirkuk (on the road to Baba Gurgur oil wells), c. 300 m., 4.1.31, 1374 ; Mosul, c. 240 m., cultivated fields, 2.4.31, 1487 ; Jabal Qizil Robat, 150 m., on stony ground, 28.3.32, 1785 ; Arbil, 375 m., in a cornfield on red loam, orange-yellow flower, 20.4.32, 2126 ; Balad

Sinjar, 402 m., on roadside grazing strip, 28.4.33, 4124 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4193 ; Kani Dolman hills, Kirkuk, 390 m., on dry stony rounded hilltop, 4291.

The florets in this series of specimens vary from yellow-green (*in sicco*) to yellow-green more or less tinged with purple. This is a narrow-leaved small-headed form, most resembling *Aucher-Eloy* 3484.

**Hedyponois cretica** (L.) Dum. Cours.

Rustam, in barley fields, 19.3.31, *Yussef Lazar* 1514 ; Acra 450–900 m. ? native name *gia bahari*, mid-Apr. 32, *Qaimaqam of Acra*, 3105.

**Helichrysum armenium** DC. var. **glanduliferum** (Sch. Bip.) Bornm. in Beih. Bot. Centralbl. 20, II, 153 (1906).

Chia-i-Mandali Mountain (nr. Walza), 1500–1800 m., 18.7.32, 2702 ; Ser Amadia, 1800 m., on top of the ridge, 3.8.33, 4988.

In 4988 the outer involucre bracts are whitish and the inner ones yellow. In 2702 and in type material of this variety (M. Gara, Kurdist., 24.7.1841, *Kotschy* 310) the bracts are all whitish.

It may be mentioned here that Bornmüller's specimen at Kew from Riwandus [Rowanduz] no. 1384 matches the type of var. *glanduliferum*. It has wider leaves than var. *lacteum* Boiss., in which variety Bornmüller places it (Beih. Bot. Centralbl. 60, B, 187 (1939)).

**H. armenium** aff. var. **glanduliferum** (Sch. Bip.) Bornm. ?

Penjwin, in the mountains, 26.6.32, *Khalil Feddo* 3444.

This has yellow involucre bracts, and the upper stem leaves are larger than in the specimens mentioned above.

**H. armenium** DC. var. **lacteum** Boiss. in Fl. Or. 3, 236 (1875).

Zawita, nr. Dohuk, Kurdistan, 900 m., on rocky limestone slopes, 27.7.33, 3733.

**H. aucheri** Boiss.

Sulaimaniya, 26.5.30, *Paterson* 815 ; Jabal Rubal, S. of Atrush, Kurdistan, 750 m., rocky (limestone) mountain slope, 12.7.33, 3617 ; Zawita, 1005 m., on rocky bluff, 1.8.33, 4970.

**H. aucheri** Boiss. ?

Kani Dolman hills, Kirkuk, 390 m., on dry stony rounded hilltop, 30.4.33, 4301.

Too immature.

**H. graveolens** (MB.) Boiss.

Beridedan (Kurdistan), 2700 m.–3300 m., leaves very white soft and woolly, Aug. 1931, *Ludlow-Hewitt* 1516.

**H. pallasii** (Spreng.) Boiss. var. **psychrophilum** (Boiss.) Boiss. Fl. Or. 3, 231 (1875).

Arl Girt and neighbouring country (Kurdistan), 2400–3600 m., common, Aug. 1931, *Ludlow-Hewitt* 1507 ; Chia-i-Mandali, 2400–2700 m., on rocky mountainside, 19.7.32, *Guest and Ludlow-Hewitt* 2729 ; Arl Giid Dagh, 3300 m., among rocks, 21.7.32, 3069.

The capitula of this material are as large as in the typical form.



**H. plicatum DC.** (*H. anatolicum* Boiss.).

Murgemir, Kurdistan, 3000 m., May 1929, *Cameron* 698 ; Chia-i-Mandali, 2400 m., on the stony mountainside, 20.7.32, 2786.

**Helminthia echioides (L.) Gaertn.**

Daltawa, in a cornfield, native name lizaij, 26.5.32, 2440.

**Ifloga spicata (Forsk.) Sch. Bip.**

Southern desert W. of Zubair, on a sandy compact soil, covered by small grit, 8.4.33, *Guest, Eig and Zohary* 5020.

**Inula graveolens (L.) Desf.**

Basra, 10.12.21, 1619A.

**Koelpinia linearis Pall.**

Mandali, 9.5.30, 780 ; nr. Kirkuk, on the road to Baba Gurgur oil wells (loose sandy soil), 300 m., 4.4.31, 1348 ; Tuz, 210 m., in cultivated fields, 6.4.31, 1408 ; Jabal Darawishka (nr. Khanaqin), 240 m., on stony hillside, 28.3.32, 1787 ; Baghdad, fields at Rustam, native name lizzaij, 25.4.33, *Yussef Lazar* 3896 ; Balad Sinjar, 429 m., on roadside grazing strip, 28.4.33, 4108 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4187 ; Kani Dolman hills, Kirkuk, 390 m., dry stony rounded hilltop, 30.4.33, 4307 ; Southern Desert (nr. Jaliba), on hard sandy soil strewn with pebbles in the *Haloxylon* association, 8.4.33, *Guest, Eig and Zohary* 5069.

Nos. 3896, 4108 have some of the fruit transformed into what appear to be insect-galls.

**Lactuca aff. hispida DC.**

Rowanduz Gorge, 450 m., on a grassy slope near the stream, 20.4.32, 2141.

This specimen is too immature to be named more precisely.

**L. scariola L.**

Baghdad (Harathiya Estate), by a saline seepage pool near a canal, 14.7.32, 3229.

**Lactuca aff. racemosa Willd.**

Arl Gird Dag, 2700 m., among rocks, flowers pale blue, 24.7.32, 2965.

This plant is intermediate between *L. racemosa* Willd. (*L. albanum* (Stev.) C.A.M.) and *L. macrophylla* (Willd.) A. Gray. In height, leaf-shape and acute inner involucre bracts this specimen resembles *L. racemosa*. In the dense glandular pubescence of the inflorescence and upper parts of the stem it is like *L. macrophylla*. The size of the capitula and leaves is intermediate between the two species. The fruit are too young to show clearly whether they will be subangustate or rostrate when mature.

Both the species referred to occur in Armenia and the Caucasus ; no material from N. 'Iraq has been examined, although they may occur there. As our plant is represented of a single gathering without mature fruit, it is uncertain whether it is a hybrid or a new species.

**L. scarioloides** Boiss.

Chia-i-Mandali (nr. Walza), 1950 m., in a ditch by a cornfield, 20.7.32, 2800.

**Launaea fallax** (J. et S.) O. Kuntze.

Basra, Oct. 1929, 289.

**L. nudicaulis** L.

Southern Desert, W. of Zubair, 8.4.33, *Guest, Eig and Zohary* 5043.

**Leontodon hispidulum** (Del.) Boiss. var. **tenuilobum** Boiss. Fl. Or. 3, 728 (1875).

Rustam, 16.2.31, 1104 ; do., in barley fields, 19.3.31, *Yussef Lazar* 1137, 1141 ; Qaraghan, on stony land, 30.3.32, 1874 ; Jazira Desert, Mar.-Apr. 33, *Edmonds* 3798 ; Baghdad, in fields at Rustam, native name hodhan, 25.4.33, *Yussef Lazar* 3898 ; Southern Desert (between Zubair and Jaliba), in a depression on sandy compact soil, 8.4.33, *Guest, Eig and Zohary* 5057.

**Matricaria** (§**Chamaemelum**) **arlgirdensis** *Blakelock* sp. nov. ; a *M. melanophylla* Nábělek e descr. capitulis minoribus, coronis longioribus acutis, radii cypselis coronatis differt. (Fig. 3, p. 59).

*Herba* 6–10 cm. alta. *Rhizoma* ramosum, usque 3 cm. longum, 0.4 cm. latum, surculos steriles et caules floriferos edens. *Caules* ascendentes vel erecti, praecipue basin versus foliosi vel subscapiformes, sparsissime hirsuti. *Folia* radicalia 1–4 cm. longa (petiolo incl.) c. 0.8 cm. lata ambitu oblonga vel ovata, in lacinias lineares acutas bipinnatisecta, irregulariter 4–7-juga, sparse hirsuta, petiolo 0.4–c. 3 cm. longo basi ampliato ; folia caulina similia, sessilia, diminuta. *Capitula* absque radiis c. 1 cm. diam. *Involucri bracteae* oblongo-ellipticae, apice rotundatae, glabrescentes vel medio sparse hirsutae, nervo fusco in sicco (vel laete viridi), margine latissime nigrofuscae scariosae ceterum virides, margine irregulariter denticulato-laceroso, c. 4 mm. longa, 2–3.5 mm. lata, intimae basi attenuatae. *Receptaculum* conico-hemisphaeroideum. *Flores* radii tubo c. 2.5 mm. longo, ligula alba obtuse et minute 3-dentata c. 7 mm. longa et 3 mm. lata. *Flores disci* lutei, corollis 3–4 mm. longis. *Cypselae* immaturae oblongo-lineares, leviter curvatae, ventre (adaxiale) prominenter tricostatae, dorso (abaxiale) apice biglandulosae, uninervae laeves, 1.5–2.5 mm. longae ; disci corona in 5–6 lobis inaequalibus profunde fissa, 1.5–2 mm. longa, lobis  $\pm$  lanceolatis vel spathulato-lanceolatis acutis irregulariter crenato-dentatis ; radii corona bilobatis ceterum ut disci.

N. 'IRAQ. Arl Gird Dagħ, 3300 m., 22.7.32, *E. R. Guest* 3065.

This species differs from *M. caucasica* (Willd.) C. Koch and *M. grandiflora* (Boiss et Houssk.) C. Koch in the smaller stature and capitula, the smaller green centres of the involucre bracts as well as in the more scapiform habit, and the long acute lobes to the corona.

**M. aurea** (L.) J. Gay.

Rustam, on channels, native name baibun, 12.3.31, 366 ; Qizil Robat, in a cornfield, native name hunkrais, 28.3.32, 1772 ; Qaraghan, in a cornfield on dry stony ground, 30.3.32, 1879 ; nr. Mahmudiya (Latifiya

Estate), 16.5.32, 2385 ; Zubair (Basra), in sandy desert on 'Iraq-Nejd frontier, native name girrais or hingirrais, 4.5.32, *Abd al Wahab Mustafa* 3166 ; Baghdad, fields at Rustam, native names hunkrais, hunkrais-al-khail, baibun, or babunnaj, 25.4.33, *Yussef Lazar* 3893.

**M. praecox** (M.B.) DC.

Shargat, Mar. 1930, 405 ; Baghdad, in cultivated fields, 28.1.31, 1101 ; Mosul, 270 m., in cultivated fields, 2.4.31, 1341 ; Qaraghan,

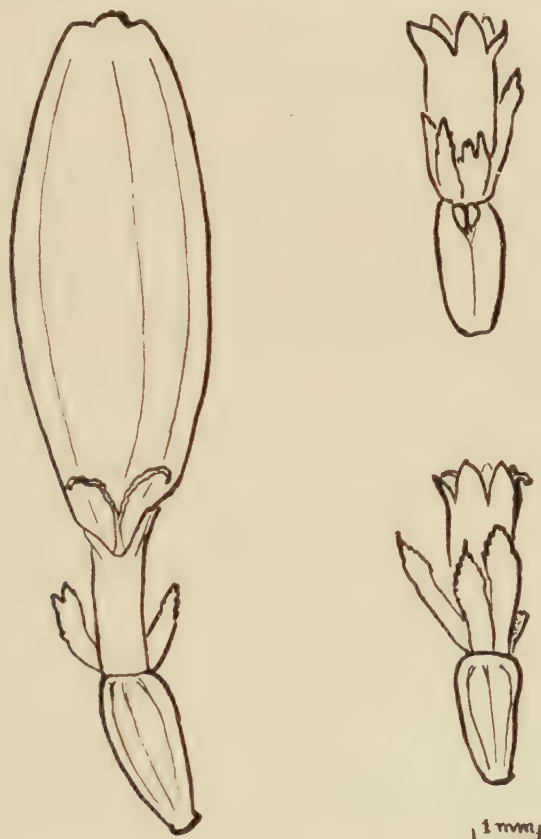


FIG. 3. Ray and disc florets of *Matricaria arlgirdensis* Blakelock.

30.3.32, 1879A ; Gowair Ferry, on sandy bank of the river by the water's edge, 20.4.32, 2191 ; Zummar (Tal Afar), c. 300-450 m., used as a fodder when dry, native name baibun, Apr.-May 32, *Mudir of Zummar* 3143 ; Arbil Province, Apr.-May 33 (and cultivated Hort. Bot. Reg. Kew, May 1934), grazed by animals, native name rubyan, *Mhd. al Radhi* 3848.

**Micropus longifolius** Boiss. et Reut.

Hinaidi, 30.3.31, *Yussef Lazar* 1148 ; Tuz, cultivated fields, 6.4.31, 1418 ; do., 210 m., at the edge of a cornfield on dry barren patches of soil, 16.4.32, 1980 ; Tauq Chai (nr. Kirkuk), c. 210 m., on dry stony torrent bed, 16.4.32, 1982 ; Tal Kaif, c. 600 m., in the hills, native name uktaimah, useful for sheep grazing, Apr.-May. 32, *Mudir of Tal-Kaif*



3210 ; Arbil Province, grazed by livestock, native name kutainah, May 33, *Mhd. al Radhi* 3870 ; Baghdad, native name qutainah, 25.4.33, *Yussef Lazar* 3887 ; Kirkuk Province, grazing plant, native name askilah, 14.5.33, *Ali Eff. Hadari* 3958 ; Balad Sinjar, 429 m., on roadside grazing strip, 28.4.33, 4103 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4188 ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4222 ; Suliman Beg (nr. Tuz), 12.4.33, *Guest, Eig and Zohary* 5089 ; Jazira Desert, 20.4.33, *Edmonds* 3819.

***Micropus longifolius* Boiss. et Reut. ?**

Nr. Felluja, native name alaich al ghozal, 6.3.30, 945.

Material too immature.

***Notobasis syriaca* (L.) Cass.**

Tuz Khurmatli, c. 210 m., 6.4.31, 1417 ; nr. Dohuk, 360 m., along ditches in a cornfield, 2228 ; Arl Gird Dagh, 2700 m., by a stream, 24.7.32, 2958.

***Onopordon canum* Eig. in Pal. Journ. Bot., Ser. J., 2, 193 (1942).**

Makatu nr. Mandali, 10.5.30, 892 (syn-type).

***Pallenis spinosa* (L.) Cass.**

Atrush, Kurdistan, 600 m., on the hillside, 12.7.33, 3626.

***Picnomon acarna* (L.) Cass.**

Badi, nr. Dohuk, 825 m., on open hillside, 25.7.33, 4421 ; Ser Amadia, 1500 m., on open hillside at the top of Gulli Mazurka, 3.8.33, 4996.

***Picris babylonica* Hd.-Mazz e descr. ?**

Makhlat, 180 m., on open steppe (*Stipa*), native name hodhan, 29.4.33, 4245 ; Kani Dolman hills, Kirkuk, 390 m., on dry stony rounded hilltop, 30.4.33, 4335, 4367 ; Jaliba (nr. Suq-as-Shiyukh), on sandy soil with small grit on surface, 8.4.33, *Guest, Eig and Zohary* 5072.

One specimen on 4367 has dark brown fruits, the rest of the material has light brown fruits. Neither type nor authenticated material of this species, *P. desertorum* Nábělek, *P. damascena* Boiss. has been seen. Eig in Pal. Journ. Bot. ser. J., 1, 76 (1938) tentatively places *P. desertorum* as a synonym of *P. babylonica*. This is the view adopted here. The bases of the pappus bristles are dilated in our material, but not so markedly so as in Nábělek's figure of *P. desertorum*.

***Pluchea tomentosa* DC.**

Amara marshes (on mud banks), native name shababaq, 13.12.31, 1628.

Escape from cultivation ?

***Pulicaria arabica* (L.) Cass.**

Basra, Oct. 1929, 311 ; Rustam, 16.5.31, *Yussef Lazar* 1184 ; Daltawa, on marshy land, native name juwaifah, 26.5.32, 2428 ; do., in a corn-field (stubble), 2434.

***P. dysenterica* (L.) Gaertn. var. *microcephala* Boiss. Fl. Or. 3, 202 (1875).**

Rowanduz Gorge (Kurdistan), 600 m., 12.10.31, 488 ; Zawita, 900 m., 10.10.31, 1584.

488 has a more scabrid indumentum than is usual in the species.

**P. foliolosa** DC.

Basra, Oct. 29, 290 ; Basra, common in date gardens, said to be used for eye disease, native name shawasar, 10.12.31, 1619.

**Pyrethrum balsamita** (L.) Willd.

Arl Gird Dagħ, 2100 m., by a stream, 20.7.32, 2824 ; do., 3000 m., by a lake, 21.7.32, 2869 ; do., 2100 m., in a damp place, 24.7.32, 2917.

No. 2869 appears to resemble Nábělek's figure and description of *Chrysanthemum* (*Pyrethrum*) *balsamitoides*. Owing to the immature state of this specimen its identification is somewhat uncertain and it is included under *P. balsamita* (L.) Willd.

**P. kotschy** Boiss.

Chia-i-Mandali, 2700 m., on a rocky cliff, with an aromatic smell, 19.7.32, 2700 ; Arl Gird Dagħ, 3300–3600 m., on rocks, 22.7.32, 3064.

**P. millefoliatum** (L.) Willd.

Arl Gird Dagħ, 3600 m., on rocks, 21.7.32, 3052.

**P. myriophyllum** C. A. M.

Ser Amadia, 1800 m., on top of the ridge, 3.8.33, 4990.

**P. myriophyllum** C. A. M. **variegatum** Boiss. Fl. Or. 3, 351 (1875).

Chia-i-Mandali, 2400 m., on the rocky mountainside, 19.7.32, 2798.

**P. parthenifolium** Willd. var. **canescens** Boiss. Fl. Or. 3, 344 (1875).

Rowanduz Gorge, 600 m., on a rocky cliff, 25.7.32, 2969.

**P. polycephalum** Sch.-Bip.

Jabals Sola and Rus (nr. Gilli) Zakho, widely distributed in the mountains, grazed as a fodder by sheep, etc., when hungry, but not normally relished much, native name buzhan (K.), 13.5.32, *Mudir of Gilli* 3148.

The flower-heads of this specimen are immature. The vegetative parts, however, match those of "Gara Kurdistaniae, 27.7.1841, *Kotschy* 341" (syn-type) at the British Museum.

**Rhagadiolus stellatus** (L.) Willd. var. **edulis** (Gaertn.) DC. Prod. 7, 77 (1838).

Rowanduz Gorge, 450 m., on a grassy slope (damp situation), 17.4.32, 2030 ; Zakho Valley, 600 m., in grassy patches among scrub oak, 25.4.32, 2254.

Both these numbers have hairy inner fruit.

**R. stellatus** L. var. **hebelaenus** DC. Prod. 7, 78 (1838).

Daltawa, native name karainah, 29.4.32, *Darwish Hadari* 2635 ; Acra, c. 450–900 m. ? kostiluk (K.), Apr. 32, *Qaimaqam of Acra* 3103.

**Rhanterium epapposum** *Oliv.*

Kowait, 20.3.32, *Mrs. Hubert Young*, 1693 ; Southern desert, W. of Zubair, on compact sandy soil covered by small stones and grit, donkey loads of this plant are brought into Zubair for fuel, it is a large bushy perennial and the name is given by Musil, native name arfaj, 8.4.33, *Guest, Eig and Zohary* 5032.

**Scolymus maculatus** *L.*

Daltawa, along channels in corn stubble, eaten by men when young, also by animals, native name kassub (general name for various types of thistle) or um-al-halaib (general name for various plants which yield milky latex, e.g., *Sonchus*, *Euphorbia*, *Cynanchum*, etc., it means "mother of milk"), 26.5.32, 2478.

**Scorzonera elata** *Boiss.*

Atrush, Kurdistan, 885 m., on red marl banks in open pine forest, 13.7.33, 4395 ; Zawita Valley, 725 m., on red marl banks, 25.7.33, 4433.

Fruiting material only.

The capitula on our specimens are somewhat longer than on the rest of the material at Kew. The inner involucre bracts are 3-3.5 cm. long in the fruiting state. In the other material at Kew the inner bracts are 2-2.7 cm. long. The height of the plant and the length of the leaves also vary considerably.

**S. lanata** *MB.*

Shaqlawā, Kurdistan, on a scree, 22.3.30, 559 ; Pirmum Pass (nr. Shaqlawa), c. 750 m., in grassy glades among oak scrub at the top of the pass, 17.4.32, 2049 ; Sulaimaniya, Kirkuk, 300 m., 31.3.32, 1921 ; Suwara Tukka, 1200 m., 23.4.32, 2212.

**S. mollis** *MB.*

Jabals Rus and Kashan (nr. Gilli) Zakho, not very common, eaten by sheep and also by the shepherds as a vegetable, native name kirisichk (K.), *Mudir of Gilli* 3149 ; Syrian Desert (between Jabal Tanf and the Euphrates), Mar.-Apr. 33, *Edmonds* 3791.

**S. mollis** *MB.* var. **platyphylla** *Bornm.* in *Beih. Bot. Centralbl.* **28**, II, 264 (1911).

Rowanduz Gorge, 350 m., on a grassy slope by the stream, 20.4.32, 2140.

**S. papposa** *DC.*

Almost certainly collected near Mosul or Kirkuk, 145 ; nr. Kirkuk, on the road to Baba Gurgur oil wells, 300 m., common on sandy soil, 4.4.31, 1347 ; Mosul, 18.4.31, *Ludlow-Hewitt* 1553 ; Jabal Hamrin (nr. Table Mountain), 150 m., on sandy ledge, 28.3.32, 1813 ; Syrian Desert (between Jabal Tanf and the Euphrates), Mar.-Apr. 1933, *Edmonds* 3790 ; Jazira Desert, 20.4.33, *Edmonds* 3809 ; Balad Sinjar-Tal Afar, 330 m., on semi-natural steppe, 28.4.33, 4191 ; Kani Dolman hills, Kirkuk, 390 m., on dry stony rounded hilltop, 30.4.33, 4297.



***S. ramosissima* DC.**

Beridedan-Murgemir, 2100-2700 m., Aug. 31, *Ludlow-Hewitt* 1526 ; Chia-i-Mandali, 2700 m., on the mountainside, 19.7.32, 2690 ; Arl Gird Dagh, 2700 m., on rocky ground, 24.7.32, 2955.

Nos. 1526, 2955 both have a pappus tinged with purple towards the top.

***Scorzonera* sp.**

Rowanduz Hills (Kurdistan), 2400-3600 m., common, August 31, *Ludlow-Hewitt* 1505.

This specimen shows only a single flower and no mature fruit.

***Senecio coronopifolius* Desf.**

Tekrit, Feb. 1930, 393 ; Hinaidi, along channels, 30.3.31, *Yussef Lazar* 1159 ; Qizil Ribat, in a cornfield, native name murair, 28.3.32, 1771 ; Jabal Hamrin (nr. Table Mountain), 150 m., on sandy soil in deep clefts of a dry wadi, 15.4.32, 1969 ; Jazira Desert, 20.4.33, *Edmonds* 3811 ; Baghdad, fields at Rustam, native name hunkrais-al-khail, 25.4.33, *Yussef Lazar* 3894 ; Ain Ghazal (Mosul Province), 360 m., in a field, 28.4.33, 4094 ; Syrian Desert (between Jebel Tanf and the Euphrates), Mar. Apr. 1933, *Edmonds* 3789 ; Ain-al-Husan (nr. Sinjar), 315 m., on open *Poa* steppe, 28.4.33, 4203 ; Southern Desert, between Zubair and Jaliba, compact sandy soil in a depression, 8.4.33, *Guest, Eig and Zohary* 5055.

***S. paucilobus* DC.**

Chia-i-Mandali, 2100-2400 m., on rocks under a cliff, 18.7.32, 2681.

***S. vernalis* W. K.**

Diana, nr. Rowanduz, 26.3.30, 713 ; Rustam, 16.2.31, 1105 ; Amadia (Kurdistan), 1050 m., on hillside and in fields in the valley, 28.3.31, 1248 ; Rowanduz, 900 m., 18.4.32, 2045 ; Dohuk, in a cornfield on stony land, 450 m., 21.4.32, 2156 ; Ain Sifni (Mosul Liwa), on hilly ground, native name kulilkah haspi (K.), 10.6.32, *Salim Effendi* 2572.

***S. vulgaris* L.**

Baghdad, 22.2.31, 1107.

***Serratula cerinthefolia* S. et S.**

Sinjar, c. 300 m., native name tahla zraf (K.) or makhzak, Apr. -May 1932, *Mudir of Sinjar* 3117 ; Atrush, 900 m., on stony hillside, 13.7.33, 3637 ; Zawita Valley, 945 m., among limestone crags, 25.7.33, 4453 ; Zawita, 982 m., on rocky slope in oak forest, 1.8.33, 4901 ; Plant used for making "tea" at Arbil, s.n.

***S. oligocephala* DC.**

Zawita Gorge, 900 m., on high slopes above the gorge, 23.4.32, 2206 ; Zakho Pass, on a sandy bank, 750 m., 25.4.32, 2264 ; Zawita, 1170 m., 1110 m., in oak forest on steep rocky slope, 4592, 4614.

***S. radiata* MB. ?**

Nr. Kirkuk, 420 m., on bare denuded earth hills, 13.4.33, *Guest, Eig and Zohary* 5097.

This material only shows one immature capitulum.

**Silybum marianum** (L.) Gaertn.

Mandali, 9.5.30, 775 ; Baghdad, in an orchard at Karada, native name qulaghan, 13.4.32, 1953.

**Sonchus oleraceus** L.

Rustam, Mar. 31, *Yussef Lazar* 182 ; Daltawa, in a date garden, native name marir, 26.5.32, 2427 ; Rustam, on the banks of the Diyala River, 24.9.47, 3511.

**Taraxacum** aff. **kurdicum** Hand.-Mazz. (*paradoxum* Hand.-Mazz. non Palmgren).

Arl Gird Dagħ, 3300 m., 12.7.32, 3070.

The beak of the fruit in our plant is thinner than in *Handel-Mazzetti's* fig. of *T. kurdicum* (Ann. K. K. Nat. Hofmus. **27**, 453 (1913) ), but shorter and thicker than in *T. stevenii* (Spreng.) DC.

**T. laevigatum** (Willd.) DC.

Jindian, nr. Rowanduz, 25.3.30, 733.

**T. montanum** (C. A. M.) DC.

Jabal E.N.E. of Seri Hassan Beg, 1950 m., on the rocky mountainside, 24.7.32, *Guest and Ludlow-Hewitt* 2914.

**T. aff primigenium** Hand.-Mazz.

Arl Gird Dagħ, 3450 m., on a grassy slope, 22.7.32, 2884.

Our plant differs from *T. primigenium* in having a white pappus and wider outer involucre bracts.

**Tragopogon kurdicum** *Blakelock* sp. nov. ; a *T. jesdiano* Boiss. et Buhse e descr. foliis 5-7-nerviis, cypselis squamuloso-muricatis, pappo sordide albo ; a *T. graminifolius* DC. capitulis cypselisque minoribus, floribus purpureis differt.

*Herba* 27-60 cm. alta. *Rhizoma* verticale, 2-4 mm. crassum, collo fibroso. *Caulis* glaber, striatus, erectus, simplex vel biramosus, foliosus. *Folia* radicalia et caulina inferiora glabra glaucescentia (?), graminea, linearia, 5-7-nerviis, basi vix ampliata, margine minute albo-hyalina serrulata, usque 36 cm. longa, 2-4 mm. lata ; folia caulina superiora basi lanceolata ampliata amplexicaulia supra  $\pm$  floccosa subtus glabra, in acumen longe lineare angustata, 1.5-11 cm. longa, 5-6 mm. lata. *Pedunculi* floriferi haud fructiferi vix incrassati. *Capitula* parva, flosculis c. 18 involucri superantibus. *Involucri bracteae* 5-7, anguste lanceolatae vel triangulari-lanceolatae, basi minute pubescentes apice minute floccosae vel glabrescentes ceterum glabrescentes, 15-20 mm. longae, 3-6 mm. latae. *Flores* ligulis purpureis (in sicco) usque 18 mm. longis, 3 mm. latis. *Cypselae* sulcatae praecipue apicem versus squamuloso-muricatae (raro sulcatae praeter apicem laeves), in rostro squamuloso-muricato crassiuscule apice incrassato gradatim attenuatae, 12-13 mm. longae (rostro incl.), c. 1.5-2 mm. latae, rostro c. 3 mm. longo. *Pappus* sordide albus, 10-12 mm. longus.

N. IRAQ. Chia-i-Mandali Mountain (Rowanduz area), 2400-2700 m., on the rocky mountainside, 19.7.32, *E. R. Guest* 2719.

In the capitulum dissected two of the inner fruits are slightly squamulose-muricate only towards the apex. These are the only two inner fruit which are mature, and are not the two central ones. The other inner fruit are immature, but appear as squamulose-muricate as the outer ones.

**T. pusillum** MB.

Chia-i-Mandali Mountain (Rowanduz area), 2700 m., at the summit of the ridge, 19.7.32, 2704 ; Arl Gird Dag, 3000 m., on the rocky mountainside, 21.7.32, *Guest and Ludlow-Hewitt* 2858.

**Vicoa divaricata** (Cass.) Benth. et Hook.

Rustam, May–Aug. 1929, 157 ; do., 1.6.31, *Yussef Lazar* 1183 ; Daltawa, native name juwaifah, 26.5.32, 2493 ; Ghurfa Plain (N. of Daltawa), dry grassy steppe, 7.7.33, 4000.

**Xanthium brasiliicum** Vell.

Basra, Oct. 1929, 308 ; Dabouni, Sept. 1929, 219 ; Rustam, common along banks of the Diyala River, native name lizaj, 11.10.32, 3467.

**Xeranthemum squarrosum** Boiss. var. **unicolor** Boiss. Diagn. ser. I, 6, 101 (1845).

Murgemir (Kurdistan), 1950 m., on the mountainside, 20.8.31, *Ludlow-Hewitt* 1511 ; Chia-i-Mandali, 1350 m., on the stony hillside, 20.7.32, 2762 ; Zawita, 840 m., 25.7.33, 3691 ; do., 1140 m., 29.7.33, 4729.

**Zoegea lepturea** L.

Tal Kaif, c. 300 m., widely distributed on the plains, useful for sheep grazing, native name saifrah, Apr.–May 1932, *Tal Kaif* 3188 ; Arbil Province, grazed by animals, native name futir, Apr. 1933, *Mhd. al Radhi* 3841 ; Ba'adhara (nr. Shaikhan), on hilly ground, fodder plant, native name kulil zarik (K.), 19.6.32, *Salim Effendi* 2592.

Our plants show setae on the involucre bracts as long as in *Z. crinita* Boiss. (up to 5–6 mm. long). In Boissier's syn-types of *Z. crinita* in Herb. Kew (Belutchistan, *Stocks* 760 ; Persia australis, *Kotschy* 900), the involucre bracts are no longer than in "Baghdad, *Aucher-Eloy* 3244" cited by Boissier as *Z. lepturea* (in Fl. Or. 3, 697). Of our plants, No. 3188 is too immature to show florets or cypselae. Nos. 2592 and 3841 agree in other characters with *Z. lepturea* (i.e., ray florets exerted, peduncles incrassate, cypselae small (c. 2 mm.)). This variety of *Z. lepturea* with the long setae seems to be the commonest one in 'Iraq. In the Syrian material of *Z. lepturea* at Kew the setae are up to 2–3 mm. long.

**Z. lepturea** L. var. **mianensis** (Bunge.) Bornm. e descr. in Beih. Bot. Centralbl. 20, II, 171 (1906).

Kirkuk Province, grazed by animals, May 33, *Ali Effendi* 3854 ; Hinnis, nr. Ain Sifni (N. Mosul), 450 m., fields, orange flowers, 12.7.33, 4050.

This differs from *Z. lepturea* only in the inner pappus scales being yellow.



## A NEW SPECIES OF DEYEUXIA FROM TIBET

N. L. BOR.

**Deyeuxia tibetica** Bor, sp. nov., *D. tianschanicae* (Rupr.) Bor\* (*D. compactae* Munro), similis sed ab ea pedunculo scabro puberuloque glumis spiculae dorso valde hirsutis recedit.

*Gramen* perenne, caespitosum, erectum, aliquando basi geniculatum. *Culmi* ad 20 cm. alti, 1-nodes, glabri, inferne scabri, striatuli, infra inflorescentiam pilosi et angulosi. *Foliorum laminae* dispares; culmorum laminae 0.5–2.25 cm. longae, involutae, raro planae, utrinque scabrae praecipue supra marginibusque, in mucronem validum brevem productae, lanceolato-acutae, explanatae 2–2.5 mm. latae; innovationum intravaginalium laminae planae, ad 6 cm. longae, 3 mm. latae, lineari-acuminatae, utrinque scabrae praesertim supra marginibusque; *foliorum vaginae* extrinsecus scaberrimae; *ligula* 2 mm. longa, oblonga, apice obtusa vel lacerata, extrinsecus scabra.

*Panicula* ad 2 cm. longa, 1.25 lata, compacta, teres, spiciformis, mollis, in pedunculo longe exserto puberulo insidens; paniculae rhachis angulata, scabra, pilosa; paniculae rami brevissimi, scabri, pilosi. *Spiculae* ad 5 cm. longae, lanceolatae, purpureae, pilosae. *Glumae* similes, 5 mm. longae (explanata inferior 2 mm. lata, 1-nervis; superior 1.5–2 mm. lata, 3-nervis), elliptico-acutae, marginibus sparse ciliatae, dorso crasse hirsutae, membranaceae, marginibus hyalinae. *Lemma* 4 mm. longum, explanatum 2 mm. latum, elliptico-truncatum, hyalinum, glabrum laeveque, purpureum, 5-nerve; 4 nervis lateralibus in aristas breves productis, nervo quinto e basi in aristam scabram geniculatam 5.5 mm. longam producto; calli pili circiter 3 mm. longi; *palea* late elliptico-acuta, 2-nervis, bicarinata, colore pallido-purpureo suffusa, carinis scaberula; rhachilla ad 3 mm. longa producta, pilis ad 4 mm. longis penicillata. *Antherae* 3, 2.25 mm. longae; *lodicae* 2, hyalinae, acuminatae; *styli* 2; *stigmata* 2, plumosa.

SIKKIM. Chakalunga, 5000 m., 1 June 1915, Rohmoo Lepcha (typus in Herb. Kew.).

TIBET. Yatung, 3500 m., 3 June 1946, Bor and Kiratram.

\***D. tianschanica** (Rupr.) Bor, comb. nov. *Calamagrostis tianschanica* Rupr. in Osten-Sacken et Rupr. Sert. Tiansch. 34 (1869). *C. compacta* Hack. ex Paulsen in Kjoeb. Vidensk. Meddel. 167 (1903). *Deyeuxia compacta* Munro in Hook. f. Flor. Brit. Ind. 7, 267 (1896).

## "ANCISTROCLADUS BARTERI"

H. K. AIRY SHAW.

The three known West African species of *Ancistrocladus* are referred to in the *Flora of West Tropical Africa*, **1** (1), 196 (1927), as *A. barteri* Van Tiegh., *A. guineënsis* Oliv. and *A. uncinatus* Hutch. et Dalz. The last-named is so far known only from the type gathering, from Southern Nigeria, and will not concern us further.

The name *Ancistrocladus barteri* first appeared in Van Tieghem's paper, "Sur les Ancistrocladacées", in Morot, *Journ. de Bot.* **17**, 154 (1903). After referring to Oliver's note in *Fl. Trop. Afr.* **1**, 175 (1868), on the possibility of some sterile specimens from S. Nigeria, Barter 1699, representing a species distinct from *A. guineënsis* Oliv., Van Tieghem proceeds: "C'est donc bien, tout au moins, une espèce autonome, que je nommerai pour le moment *A. de Barter* (*A. Barteri* v. T.)." On the next page (p. 155) he states that the vegetative and anatomical characters of this plant are so distinct that it must constitute a new genus, "que je nommerai Ancistrelle (*Ancistrella* v. T.). Ce sera désormais l'Ancistrelle de Barter (*Ancistrella Barteri* v. T.)." On later pages (pp. 158, 162, 163) the anatomical characters are described, but no description of the external morphology is provided. This raises the question as to whether the generic name *Ancistrella* is validly published\*. (Neither it nor the specific name *Ancistrella barteri* is cited in the *Flora of West Tropical Africa*). It is, however, in any case clear that the name *Ancistrocladus barteri* is an invalid one, since it was proposed provisionally—"pour le moment." The name which Van Tieghem accepted was *Ancistrella barteri*. There seems little doubt that this plant not only is not generically distinct from *Ancistrocladus*, but that it is in fact merely a form of *A. guineënsis* Oliv.

But a curious mistake has occurred in the *Flora*. Although the Nigerian specimen, Barter 1699, the type and sole basis of both of Van Tieghem's invalid or doubtfully valid names, is cited (correctly) under *A. guineënsis* Oliv., the name *A. barteri* Van Tiegh. has been employed for a mixture of two species occurring in Sierra Leone: (a) a plant with diffuse inflorescences, hardly separable from *A. guineënsis*; (b) a very distinct species with congested inflorescences, now known to occur from Sierra Leone to the Gold Coast. This latter species is without a valid name or description, since the name *A. barteri* Van Tiegh. is not only invalid but is almost certainly synonymous with *A. guineënsis* Oliv. The following new name and adjusted synonymy for these two species are therefore proposed.

***Ancistrocladus abbreviatus*** Airy Shaw, sp. nov., ab *A. guineënsi* Oliv. inflorescentia valde congesto-abbreviata, ab *A. uncinato* Hutch. et Dalz. foliis multo amplioribus facile distinctus; ob fructum (in *A. guineënsi* ignotum) in genere maiusculum alis abbreviatis inaequalibus crassiusculis cum speciebus Asiaticis *A. hamato* (Vahl) Prain, *A. wallichii* Planch. et *A. attenuato* Dyer forsan collocandus.

[*Ancistrocladus barteri* Van Tiegh. sec. Hutch. et Dalz. *Fl. W. Trop. Afr.* **1** (1), 196 (1927), *pro parte* (quoad Scott Elliot 4797), *non* Van Tiegh.].

\* As with other genera and species of Van Tieghem's: cf. the case of *Amyxa*, referred to in *Bull. Misc. Inform., Kew*, **1940**, 261 (1940).

*Frutex scandens, rarius suffrutex* (?). *Rami* 3–5 mm. (raro usque 10 mm.) crassi, cortice suberoso brunneo plerumque rugoso-fisso, uncis validis rigidis. *Folia* oblongo-oblancheolata vel spatulato-oblancheolata, ampla, 13–30 cm. longa, 5–12 cm. lata, basi in petiolum alatum sensim spatulato-angustata, apice plerumque perfecte rotundata rarius obtusissime angulata, chartaceo-coriacea, glaberrima, siccitate saepe rubescentia; costa modice gracilis, subtus valde prominens et saepe carinata, supra plana, nervis secundariis gracilibus 5–7-jugis angulo 45° ortis marginem versus procurvis et indistincte anastomosantibus, venulis ultimis pulchre et crebre reticulatis. *Inflorescentia* ut videtur terminalis, valde abbreviata, 1–2 cm. longa, simplex vel ramulis 2–4 praedita, floribus congestis, bracteis conspicuis ovatis acutis 1.5 cm. longis, pedicellis 2–5 mm. longis. *Flores* majusculi: alabastra obovoidea, circiter 8 mm. longa et 4 mm. diametro. *Sepala* late obovata usque suborbicularia, 4–6 mm. longa, rigida, crassa, subcarnosa, dorso glandulis lenticelliformibus (vel “foveolis elevatis”) 2–6 conspicue notata, intus punctata. *Petala* contorta, lata ovata usque suborbicularia, firma, 5 mm. longa, viridia, vel basi lutea apice lutea et rosea (teste *Linder*). *Stamina* 10, brevissima, alternatim 2 et 2.5 mm. longa; filamenta longiora basi leviter dilatata, breviora vix dilatata; antherae basifixae, oblongo-ellipsoideae, 1–1.5 mm. longae, thecis parallelis laterali-introrsis. *Styli* 3, in ovarii apice truncato-conico insidentes, liberi, 2.5–3 mm. longi, basi attenuati et sigmoideo-curvati, apicem versus valde incrassati, stigma magnum capitato-pileiforme subhippocrepidiforme gerentes. *Fructus* (alis exclusis) circiter 1.5 cm. longus, alis inclusis 2–2.5 cm. longus, obconicus, ob margines alarum subliberos valde angulatus, alis plerumque valde inaequalibus (una brevissima tribus elongantibus quinta varia) erectis vel patulis intus basi incrassatis gibboso-pulvinatis.

SIERRA LEONE. In forest by Kora, Scarcies, 13 Feb. 1892, *Scott Elliot* 4797: “Undershrub”. Magbile, 100 ft., 8 Dec. 1915, *Thomas* 6268, 6286. Vernacular name: *bokbola* (Mende); *nyewo* (L. . . .). River bank, Njala, 29 Dec. 1930, *Deighton* 1852: “Liane with hooks. Green flowers. Sepals enlarge in fruit”. Njala, in fringing forest by river, 5 Jan. 1933, *Deighton* 2589.

LIBERIA. Pehata (Paiata, Pieta), Upper St. Paul's River, at edge of brook in swamp, 15 Oct. 1926, *Linder* 1110: “Heavy vine. Leaves leathery. Flowers in clusters on modified branch that is armed with a series of hooks. Petals pink and yellow in front, yellow at base”.

GOLD COAST. On banks of River Densu, near Manhia, 24 Nov. 1934, *Akpabla* 219: “A huge climber, growing on shrubs. Leaves broad and obovate, flowers white, fruits hard. Stems have curved tendrils”.

***Ancistrocladus guineensis*** Oliv. in *Oliv. Fl. Trop. Afr.* **1**, 175 (1868).

*Ancistrocladus barteri* Van Tiegh. in Morot, *Journ. de Bot.* **17**, 154 (1903), *nom. provis.*; Hutch. et Dalz. *Fl. W. Trop. Afr.* **1** (1), 196 (1927), pro parte (quoad *Scott Elliott* 3841 et 4860).

*Ancistrella barteri* [Van Tiegh.] Van Tiegh. *l.c.* 155 (1903).

S. NIGERIA. River, Old Calabar, Feb. 1863, *Mann* 2234 (type of *A. guineensis*): “Climbing shrub 10–15 ft. high”. Probably this, but sterile: Onitsha, 1857, *Barter* 1699 (type of *A. barteri*): “Shrub, scan-



dent, 14 feet, supporting itself by hooked spines". Vegetational reconnaissance to Omo (late part Shasha) and Shasha Forest Reserves : about  $2\frac{1}{2}$  miles S.W. of Etemi, in young secondary high forest about 30 ft. up, 13 March 1946, *Jones & Onochie* (For. Herb. Ibadan) 16605 : "Climber. Leaves and fruits collected from the ground." Veg. rec. Omo & Shasha F.R. : Grace Camp (Fowa), in very broken forest near timber road about  $\frac{1}{2}$  mile N.W. of camp, 23 March, 1946, *Jones & Onochie* 16641 : "Climber. Enlarged fruiting calyces madder red. Brown and dry when ripe." Prov. Ijebu, distr. Ijebu Ode, near Itemi, in *Strombosia-Corynanthe-Diospyros* and *Drypetes* high forest, 26 March, 1946, *Tamajong* (F.H.I.) 16757 : "Woody climber to 30 ft. Leaves with pale green underfaces. Flowers [sic] pink petaloid? on underface."

SIERRA LEONE. N.W. Boundary, in forest on hills facing the sea, 5 Dec. 1891, *Scott Elliott* 3841 : "Shrub about 14 feet". Near Duunia, Talla, 16 Feb. 1892, *Scott Elliott* 4860. Benduhun (Tunkia), at edge of forest, 13 Dec. 1939, *Deighton* 3813 : "Tall climber. Greenish-white flowers. The roots are boiled and decoction drunk as a laxative". Vernacular name : *jenigbuli* or *jenigbui* (Mende). Kwaoma, in secondary bush, 25 Jan. 1940, *Deighton* 3885 : "Climber. Flowers borne at the end of the hook-bearing side shoots. ?*A. guineënsis* with habit altered on the regrowth from a cut stem".

The Sierra Leone material has rather more strongly reticulate venation on the mature leaves, and perhaps slightly shorter and thicker pedicels, than the type gathering from Nigeria, but it is doubtful whether the western plant represents anything more than a local race.

A description of the hitherto unknown ripe fruit of *A. guineënsis* follows, drawn up from the three recent collections from Ijebu province.

*Fructus* subglobosus, 6–7 mm. diametro, conspicue umbonatus, marginibus subliberis alarum conspicue angulatus ; alae valde inaequales, 3 longiores et 2 (alternae) breviores, longiores spatulatae, 3·5–4·5 cm. longae, breviores obovato-oblongae, 1–1·5 cm. longae, apice rotundatae, subtus conspicue nervosae, supra sublaeves.

## TWO NEW GRASSES FROM INDIA

N. L. BOR.

**Isachne fischeri** Bor, sp. nov., *I. bourneorum* Fischer proxima sed ab ea inflorescentia racemosa, habitu annuo, culmo brevior valde differt. Syn. *I. Kunthiana* Wight et Arn. var. *nana* Fischer in Gamble, Flor. Madras, pt. 10, 1796 (1934).

Gramen annuum. Culmi ad 5 cm. alti, gracillimi, erecti, glabri laevesque, caespitosi, nodis barbati. Foliorum laminae 6 mm. longae, 1·5 mm. latae, lanceolato-oblongo-acutae, utrinque pilis longis albis tectae, utrinque marginibusque scabrae ; foliorum vaginae inflatae, striatae, internodiis breviores, glabrae vel pilis albis tectae, marginibus ciliatae ; ligula ad seriem pilorum redacta.

Inflorescentia simpliciter racemosa, plerumque 5-spiculata ; spiculae binatae, una pedicello longo, altera pedicello brevi sistens, 2·75–3 mm.

longae, elliptico-acuminatae (a dorso visae), 2-flores, pedicellis scabris insidentes. *Gluma inferior* 2.75 mm. longa, elliptico-acuminata, paene mucronata, 3-nervis, viridis, marginibus hyalina, margine uno vel utroque pilis longis instructa ; *gluma superior* similis sed 5-nervis. *Anthoecium inferum* ♂ ; *lemma* 3 mm. longum, membranaceum, anguste ellipticum, acutum, glabrum laeveque, 7-nerve ; *palea* similis sed minor, 2-nervis ; *antherae* 3, 1.5 mm. longae. *Anthoecium superum* ♀ vel hermaphroditum ; *lemma* 2 mm. longum, ambitu anguste elliptico-acutum, albo-chartacea, dorso rotundatum, minute pilosum ; *palea* similis. *Caryopsis* non visa.

INDIA. Madras: summit of Anaimudi, Travancore High Range, 2900 m., Sept. 1933, *E. Barnes* (typus in Herb. Kew.)

**Dimeria blatteri** *Bor*, sp. nov., *D. stapfianae* C. E. Hubb. similis sed ab ea spiculis multo majoribus facile distinguitur.

*Gramen* annuum. *Culmi* ad 30 cm. alti, graciles, erecti, glaberrimi laevesque, nodis barbati. *Foliorum laminae* 10 cm. longae, 4 mm. latae, in apicem longe acuminatum attenuatae, supra pilosae, infra pilis albis e tuberculis ortis pilosissimae, marginibus pilis similibus e tuberculis ortis ciliatae ; pili demum caduci tum margines et laminae scabrae ; *foliorum vaginae* laxae, pilosae vel nullo modo scabrae ; *ligula* membranacea, 1.5 mm. longa, margine superiore pilis 1.5 mm. longis ciliata.

*Inflorescentia* e racemis 3-4 subdigitatis confertis pedunculatis constructa ; racemi rhachis 4-angulata vel subteres, laevis glabraque ; pedicelli alterni, clavati, apice obliqui, 1-1.5 mm. longi, apice breviter barbati. *Spiculae* (cum callo 1.2 mm. longo) 1.2 cm. longae, valde compressae, basi et carina inferne dense ciliatae, sursum pilis albis callo paullo longioribus sparse pilosae. *Gluma inferior* 8 mm. longa, dorso rotundato fusco-brunneo levissime curvato, parte quinta infima pilis albis dense ciliato, parte mediana fere tereti et spongiosa, marginibus planis inter se adpressis quam dorsum pallidioribus ; *gluma superior* 1 cm. longa, ut *gluma inferior* e parte mediana crassa spongiosa valde coriacea et partibus marginalibus tenuioribus pallidioribus sistens, dorso rotundato inferne dense superne sparse ciliato, parte crassa dorsali quadrante supremo in alam expansa, ala utrinque pilis 1-2 longis albis basi bulbosis instructa. *Anthoecium inferum* vacuum ; *lemma* circiter 6 mm. longum, hyalinum, oblongum ; *palea* nulla. *Anthoecium superum* hermaphroditum ; *lemma* circiter 8 mm. longum, compressum, dorso aliquanto scabrum, in lobos duos triangulares 2 mm. longos divisum ; *palea* nulla ; *arista* 2.6 cm. longa, geniculata ; *pars inferior* fusco-brunnea, torta, 8 mm. longa ; *pars superior* haud torta, pallidior, 1.8 cm. longa, antrorse scabra ; *antherae* 3.5 mm. longae.

INDIA. Bombay: Khandala, Echo Point, Oct. 1918, *Blatter et McCann* (typus in Herb. Blatter, St. Xavier's College, Bombay).

## A CONTRIBUTION TO THE FLORA OF EAST TROPICAL AFRICA.

J. P. M. BRENNAN

## RANUNCULACEAE.

**Clematis dolichopoda** Brenan, nom. nov.—*Clematis longipes* Engl. in Engl. Bot. Jahrb. 45, 273 (1910), non *C. longipes* Freyn in Abhandl. Naturwiss. Ver. Bremen 7, 5 (1880).

In the Index Kewensis *C. longipes* Freyn is wrongly stated to have been published in volume eight of the periodical cited above.

## CAPPARIDACEAE.

**Capparis** (§*Eucapparis*) **victoriae-nyanzae** Brenan, sp. nov. ; ab omnibus speciebus africanis hujus sectionis, quibus stipulas spinosas et flores hermaphroditos in inflorescentias densas subumbellatas ad apicem ramorum elongatorum confertas praebent, sepalis exterioribus densiuscule pilosis facile distinguenda ; a *C. tomentosae* Lam. formis, quibus inflorescentiam similem nonnunquam praebent, floribus omnino multo minoribus, sepalis exterioribus in statu sicco viridibus, sepalis interioribus glabris differt.

*Frutex* scandens, verisimiliter valde ramosus. *Rami* juniores dense ± fulvo- vel ferrugineo-pubescentes, vetustiores indumento plus minusve persistenti vestiti. *Folia* basi stipulis spinosis parvis 1–2 mm. longis recurvatis armata, petiolo 2–3 (–5) mm. longo dense fulvo-pubescenti, late elliptica vel interdum ovato- vel oblongo-elliptica, apice rotundata vel emarginata, basi emarginulata vel interdum rotundata, 1·7–4·9 cm. longa, 1–2·7 cm. lata, chartacea, supra pubescentia, subtus dense pubescentia, utrinque opaca, nervis lateralibus circiter 4–6-jugis, supra subinconspicuis, subtus parce prominentibus. *Flores* hermaphroditi, in apice ramorum plus minusve elongatorum foliatorum in inflorescentias abbreviatas densas subumbelliformes dispositi ; pedicelli 0·6–1·2 cm. longi, pilis patentibus nitidulis albidis vel subfulvis circiter 0·75 mm. longis dense vestiti, interdum basi bracteati ; bracteae foliaceae plerumque rotundatae. *Sepala* duo exteriora (in statu sicco) viridia, coriacea, pilis albidis patentibus circiter 0·5 mm. longis densiuscule vestita, suborbicularia, 5–6 mm. longa, valde concava, sub anthesi cymbiformia ; duo interiora pallida, viridi-albida, rigide chartacea, margine minute ciliolata, ceterum glaberrima, suborbicularia, 5–6 mm. longa, concava sed haud vel vix cymbiformia. *Petala* membranacea, venosa, obovato-oblonga, apice rotundata, 8 mm. longa, 4·5 mm. lata, extrinsecus parce pilosa, intus praesertim basin versus densius pilosa, pilis crispis albidis pluricellularibus, margine ciliata. *Stamina* numerosa, circiter 1·5 cm. longa. *Gynophorus* gracilis, sub anthesi circiter 1·5 cm. longus. *Ovarium* glabrum, ellipsoideum, circiter 2 mm. longum, circiter 1·2 mm. latum, stylo brevi conico coronatum, stigmate punctiformi. *Fructus* ignotus.

TANGANYIKA TERRITORY. Lake Province, Mwanza District : Nyegezi, 10 April 1933, *N. V. Rounce* 307 (typus in Herb. Kew.) :—close to donga, climbing acacia tree ; scrambling thorny climber.



The colour of the petals is not stated by the collector. The specimens have been carefully dried, however, and the petals have a curious tint suggesting that they may have been pinkish or reddish when living.

This very distinct species will not run down at all in the key to the African species of *Capparis* by Gilg and Benedict in Engl. Jahrb. 53, 184-188 (1915), its particular combination of characters not being accounted for in that key. One sheet of the type-number (a duplicate from the Amani Herbarium) has the determination "*Capparis tomentosa* Lam." pencilled on the label and was laid away under that species, from which, however, it is very easily distinguished both by its general appearance and by the characters enumerated in the diagnosis. Its probable affinity is not, I consider, with *C. tomentosa* Lam. but with the smaller flowered species such as *C. citrifolia* Lam. and *C. stuhlmannii* Gilg.

The epithet refers to Lake Victoria Nyanza, whose southern shore is formed by Mwanza District and on which the town of Mwanza is situated.

#### PORTULACACEAE.

#### THE TAXONOMIC POSITION OF THE GENUS CALYPTROTHECA.

A fruiting specimen labelled "*Talinum* sp.", collected by Mr. and Mrs. Hornby in Tanganyika Territory (Central Province, Mpwapwa District, 7 May 1938, *Mr. and Mrs. Hornby* 692) was recently sent to the Imperial Forestry Institute, Oxford, by Mr. P. J. Greenway of the East African Agricultural Research Institute, Amani. This specimen showed capsules dehiscent by six valves splitting upwards from the base but remaining connate at apex and falling off like a lobed cap to expose a single shining black seed with an oblique orange verruculose caruncle at base. These extraordinary fruits were immediately reminiscent of the published illustrations of the genus *Calyptrotheca* Gilg, hitherto little-known and referred to the family *Capparidaceae* (Engler, Pflanzenw. Afr. 3, pt. 1, t. 169 on p. 254 (1915); and repeated by Pax et K. Hoffmann in Nat. Pflanzenfam., ed. 2, 17 b, t. 115 on p. 207: 1936). Close comparison showed that Mr. and Mrs. Hornby's specimen was an exact match with the pictures of the infructescence, detached fruit and seed of *Calyptrotheca stuhlmannii* Gilg. Although I have not seen the type-specimen of this species (*Stuhlmann* 337, from Ugogo, near Messwejo, Masai Highland) and it is now perhaps no longer in existence, yet the agreement between Mr. and Mrs. Hornby's specimen and the description and illustrations is so good that I feel convinced of their identity.

However the suggested determination of "*Talinum* sp.", mentioned above, seemed likewise, *prima facie*, a very reasonable and probable one, and on examining East Tropical African material of *Talinum* a close correspondence was found with *Talinum taitense* Pax et Vatke. Mr. and Mrs. Hornby's specimen was evidently collected in a leafless condition, but *Burt* 3937, Mpwapwa at Gulwe, 1005 m., 26 Apr. 1932 (Herb. Kew.), doubtless represents the flowering and leafy stage. These two specimens appear to differ from *T. taitense* merely in the inflorescence. In them the lateral branches of the panicle bear closely branched but distinctly cymose partial inflorescences (in this agreeing with the illus-

trations of *Calyptrotheca stuhlmannii*; in *T. taitense* proper the lateral branches are often very abbreviated and bear dense fascicles of flowers. These two types of inflorescence are unquestionably homologous, the latter merely representing a state of the former in which the secondary axes of the partial inflorescences are greatly abbreviated or suppressed. This is strongly supported by a sheet of *Talinum taitense* (Greenway 4578, Kisiwani, S. Pares, 760 m., 2 Feb. 1936), in which some of the partial inflorescences are typical of *T. taitense* while others are laxer and distinctly cymose, thus approaching those of *Calyptrotheca stuhlmannii*. On present evidence, therefore, I consider that the differences noted in the inflorescence are perhaps due merely to environmental conditions but are not taxonomically significant, and would thus regard *Calyptrotheca stuhlmannii* and *Talinum taitense* as synonymous. It must, however, be emphasised that this view is based on the very limited material at present available, and is liable to revision in the future; this must not, though, be taken to imply doubt about the two being congeneric. From what has been written it will be clear that the affinity and present taxonomic position of *Calyptrotheca* in *Capparidaceae* is called in question.

Gilg founded *Calyptrotheca* in Engl. Bot. Jahrb. 24, 307-8 (1897), on the single species *C. somalensis* Gilg, whose type-specimen was *Ruspoli-Riva* 698, from Somaliland; later he added a second species from Tanganyika Territory, *C. stuhlmannii* Gilg in Engl. Bot. Jahrb. 33, 230 (1903). He (1897) placed *Calyptrotheca* in *Capparidaceae* but noted its isolated position in the family, and for this reason proposed it as the type of a new subfamily *Calyptrothecoideae* Pax et Gilg which was duly described in Engler et Prantl, Nat. Pflanzenfam., Nachträge zu 3 (2), 177-8 (1897). In the second edition of Die Nat. Pflanzenfam. 17 b, 207, (1936), Pax and K. Hoffmann were content to follow Gilg's view of the position of the genus.

It is difficult to believe that any of these authors can have taken into account the possibility of *Calyptrotheca* belonging to *Portulacaceae*. It is particularly surprising that Pax and Hoffmann should not have done so, since they were also responsible for *Portulacaceae* in the second edition of Die Nat. Pflanzenfam., published two years previously (1934). Now the paired involucre bracts (treated by Pax and Hoffmann as two outer sepaloid tepals), the unilocular ovary with basal placentation, not to mention the characteristic dehiscence of the capsule, the large caruncle (very anomalous in *Capparidaceae*) and the marked resemblance in facies to *Talinum*, seem to me irresistible evidence of close relationship with *Portulacaceae*. Indeed there seems to be nothing against this view, and therefore the suppression of the subfamily *Calyptrothecoideae* and the transference of *Calyptrotheca* from *Capparidaceae* to *Portulacaceae* are here proposed.

Among the *Portulacaceae*, *Calyptrotheca* clearly finds its closest affinity in *Talinum* Adans., and it might be maintained that they should be regarded as synonymous. However the 4-6-ovulate ovary, the one-seeded capsule dehiscing by 6 valves and the large seed of *Calyptrotheca* contrast strongly with the many-ovulate ovary, the many-seeded capsule dehiscing by 3 valves and the small seeds of *Talinum*. The habit of one (at least) of the species of *Calyptrotheca* (*C. taitensis*, vide infra) is very remarkable, it being described as a shrub 3-7 m. high and sometimes (at least) climbing, while *Talinum* proper is predominantly herbaceous or suffrutescent. It

may also be noted that the sculpturing of the extine of the pollen-grains of *C. taitense* differs considerably from any of those figured for the *Portulacaceae* by Franz in Engl. Bot. Jahrb. 42, 28 sqq. (1908). In *C. taitense* the extine is lophate, being divided into numerous  $\pm$  polygonal areolae by raised ridges which are rough with dense, short, sharp, conical papillae. For these reasons I consider that *Calyptrorhiza* should be retained as a genus distinct from *Talinum*.

The latest revision of *Talinum* is by von Poellnitz in Fedde, Repert. 35, 1-34 (1934). One species, *T. ruae* Chiov., is noted as being anomalous in having a capsule dehiscing by six valves. But the type of *T. ruae* is *Ruspoli-Riva* 698, which, as we have previously seen, is also the type-number of *Calyptrorhiza somalensis* Gilg! \*The descriptions of these two species give no evidence of a mixture under *Ruspoli-Riva* 698, and *Talinum ruae* Chiov. thus automatically becomes a synonym of *Calyptrorhiza somalensis* Gilg.

We have already expressed the opinion that *Talinum taitense* Pax et Vatke and *Calyptrorhiza stuhlmannii* Gilg are conspecific. Von Poellnitz (*op. cit.*) placed *T. taitense* next to *T. ruae*, but, since the fruits of the former were unknown to him, he did so presumably on the evidence of facies alone. The key-characters that he uses to separate these two are really ludicrous in their inadequacy (*T. ruae*: leaves unknown, capsule 6-valved from base; *T. taitense*: leaves obovate-cordate, capsule unknown!). The characters used by Gilg to separate the two species of *Calyptrorhiza* are derived from the inflorescence and pedicel length, of which the latter especially is striking: it may also be noted that there appears to be a wide difference in tepal size between the two. For the present, therefore, it is proposed to retain the two species separate.

***Calyptrorhiza* Gilg** in Engl. Bot. Jahrb. 24, 307-8 (1897) [Portulacaceae-Calandrinieae-Calandrinieae]: a *Talinum* Adans., cui affinis, habitu an semper?, ovario 4-6-ovulato, capsula monosperma valvulis 6 dehiscente, semine magno differt.

***Calyptrorhiza taitensis*** [Pax et Vatke] *Brenan*, comb. nov.—*Talinum taitense* Pax et Vatke in Engl. Bot. Jahrb. 17, 585 (1893); Engler, Pflanzenw. Afr. 3 (1), 155 (1915); von Poellnitz in Fedde, Repert. 35, 10 (1934), et in *op. cit.* 48, 194 (1940); Pax et K. Hoffmann in Engl. et Prantl, Nat. Pflanzenfam. ed. 2, 16 c, 249 (1934); A. Peter, Fl. Deutsch-Ostafri. 2, 263, 265 (1938). *Calyptrorhiza stuhlmannii* Gilg in Engl. Bot. Jahrb. 33, 230 (1903); Engler cum Gilg, Pflanzenw. Afr. 3, pt. 1, p. 255, t. 169 (p. 254) (1915); Gilg et Benedict in Engl. Bot. Jahrb. 53, 265 (1915); Pax et K. Hoffmann in Engl. et Prantl, Nat. Pflanzenfam. ed. 2, 17 b, p. 207, t. 115 (1936).

***Calyptrorhiza somalensis*** Gilg in Engl. Bot. Jahrb. 24, 307-8 (1897); Engler cum Gilg, *loc. cit.* (1915); Gilg et Benedict, *op. cit.*, p. 265 (1915); Pax et K. Hoffmann in Engl. et Prantl, Nat. Pflanzenfam. ed. 2, 17 b, p. 207, t. 115 (1936). *Talinum ruae* Chiov. in Ann. Bot. Roma, 13, 376 (1915); von Poellnitz in Fedde, Repert. 35, 9-10 (1934), et in *op. cit.* 48, 194 (1940).

\*Since writing the above, I find that Chiovenda has (Angiospermae-Gymnospermae: 48 (1939), extracted from: Missione Biologica nel paese dei Borana, Raccolte botaniche) made the necessary reduction of *Talinum ruae* Chiov. to *Calyptrorhiza somalensis* Gilg, but he leaves the genus without comment in *Capparidaceae*.



## CELASTRACEAE.

**Mystroxydon aethiopicum** (Thunb.) Loes. var. **pubescens** (Oliv.) Brennan, comb. nov. *Mystroxydon burkeanum* Sond. Fl. Cap. 1, 470 (1859-60). *Elaeodendron aethiopicum* Thunb. Oliv. var. *pubescens* Oliv. Fl. Trop. Afr. 1, 365 (1868). *Casine burkeana* (Sond.) O. Kuntze, Rev. Gen. 1, 114 (1891). *Casine aethiopica* Thunb. var. *burkeana* (Sond.) Loes. in Engl. Bot. Jahrb. 17, 552 (1893). *Mystroxydon aethiopicum* (Thunb.) Loes. var. *burkeanum* Sond. Loes. in Engl. Bot. Jahrb. 28, 159 (1900).

Though the leaf-shapes of the types of *Mystroxydon aethiopicum* var. *pubescens* and *M. burkeanum* appear very different, connecting links may be found.

## LEGUMINOSAE.

**Smithia** (*Ekstichya*) **stolonifera** Brennan, sp. nov. : juxta *S. strigosam* Benth. ex Baker in videtur ponenda. habitu, pilis caulinis laxius dispositis leviter deflexis vel subhorizontaliter patentibus nec adpressis nec adscendentibus, foliis gracilibus in statu sicco obscurius viridibus, foliolis plerumque numerosioribus, inflorescentiis paucifloris, bractearum costa vix incrassata, floribus minoribus abhorret ; subsimilis etiam *S. ochreateae* Taub. et *S. speciosae* Hutch., ab illa characteribus jam notatis, ab hac praeterea floribus multo minoribus statim distinguitur.

*Herba vel suffrutex ? Caulis* ut videtur erectus, circiter 60 cm. altus, ramos valde breves praecipue superne emittens, nonnunquam in regione radicefera stolonibus tenuibus folia reducta in parte distali ferentibus praedita, superne in statu sicco purpureus pilis pallidis eglandulosis valde inaequilongis basi dilatato-incrassatis leviter deflexis vel subhorizontaliter patentibus saepe dense obsitis, inferne subglaber griseo-olivaceus longitudinaliter lineatus. *Folia* pinnata, ut videtur sensitiva, 1-2.6 cm. longa ; petiolus 1-5 mm. longus ; rhachis pilis brevibus et longioribus pubescens, apice in aristam brevem productus ; foliola 9-17-juga, petiolulo brevissimo subsessilia, lineari-oblonga, rigida, 2-4.5 mm. longa, 0.75-1.5 mm. lata, apice plerumque rotundata usque subacuta rarius acuta vel subfalcata, basi latere antico leviter rotundata latere postico rotundato-subauriculata, supra glabra saturate viridia vel olivacea, subtus pallidiora pilis paucis albidis inter costam et marginem anticum insertis exceptis glabra, margine postico parce ciliato, antico ipso glabro, costa excentrica juxta marginem anticum appropinquata, marginem alterum versus nervos laterales parum ramosos circiter 3-6 plerumque subtus prominulos emittente ; stipulae scariosae, brunneae, lanceolatae, 5-9 mm. longae, apice attenuato-subfiliformes. *Inflorescentiae* axillares, pauciflorae, congestae nec strobiliformes, usque ad circiter 1 cm. longae, ad nodos sessiles vel subsessiles et apicem caulis et ramorum brevium versus aggregato-congestae ; rhachis valde abbreviata, vix distincta, pilis pallidis haudquaquam flavescentibus usque aureis satis dense obsita ; bractae circiter 5 mm. longae, anguste deltoideo-ovatae, longitudinaliter nervatae, tenuiter scariosae, apice caudato-acuminatae, costa haud vel vix incrassata pilis minutis puberula, marginibus ciliatis, cetera subglabrae ; pedicelli 3-4 mm. longi, pilis albidis patentibus inaequilongis obsiti, siccitate purpurei, apice valde curvati, ut

flores comparate deflexi sint ; bracteolae apice pedicelli positae, 6 mm. longae, sursum curvatae, rigidiusculae, anguste lanceolatae, apice longe et acutissime attenuatae, superne puberulae, marginibus ciliatis. *Calyx* bilabiatus, in statu sicco basi fulvus, ad margines lobi mediani labii inferioris purpura tinctus, cetera stramineus, labio superiore 4-5 mm. longo pubescente, lobis usque ad  $\frac{3}{4}$  connatis apice obtusis vel subobtusis, labio inferiore 5.5 mm. longo antice pubescente postice subglabro profunde trilobato, lobo mediano 4.5 mm. longo concavo dorso carinato et curvato in medio circiter 1 mm. alto (a latere viso) apice acuto, lobis lateralibus 3.25 mm. longis suboblique ovato-ellipticis apice subacutis. *Corolla* parva, labium superius calycis parum superans ; vexillum (explicatum) 5 mm. longum, obovatum, apice emarginatum ; alae 4.5 mm. longae, anguste oblongo-oblancoolatae, apice rotundato-obtusae ; petala carinae libera, 5.5 mm. longa, oblique oblongo-obovata, apice rotundata, aliquantulum sursum curvata (alis papilionis similia), margine superiore basin versus lobulo minimo retrorsum directo praedito. *Stamina* monadelpha, tubo unilateraliter fisso. *Ovarium* glabrum, biovulatum, inter ovula subconstrictum, stylo glabro. *Legumen* calyce inclusum 1- (vel 2- ?) articulatum, glabrum, pallide fulvum, articulo circiter 2 mm. longo et 1.5 mm. lato venulis prominulis notato. *Semen* nigrum.

TANGANYIKA TERRITORY. Lake Province, Bukoba District : Maruku road, 1219 m. approx., Aug. 1931, *Haarer* 2089 (typus in Herb. Kew.).

The collector does not note the flower colour. The material is mostly in bloom and I have examined only a single mature pod. It remains to be observed how constant the production of stolons is in this species ; they are well shown on one plant of the above collection but the roots of the other plant have been severely trimmed, and it is hence difficult to tell whether the remaining bases belong to roots or stolons.

**Smithia** (§*Kotschya*) **platyphylla** *Brenan*, sp. nov. ; *S. kotschy* Benth. affinis, indumento caulis, stipulis angustioribus nec recurvis nec reflexis, racemis pedunculatis, floribus plerumque minoribus differt ; *S. uguenensi* Taub. ex Engl. atque *S. goetzei* Harms remotius cognata, notis eisdem, praeterea inflorescentiis haud strobiliformibus nec valde densis, aspectu ut videtur parum glutinoso recedit.

*Frutex* vel *arbor* trunco gracili (ex *Wigg*) ; rami et ramuli pilis brevissimis adscendentibus basi conico-incrassatis (pilis longioribus praeter ad pedunculos inflorescentiasque etiam juventute omnino absentibus) densissime obsiti, hebetes cano-fulvi, inferne obscuriores defoliati stipulis plus minusve persistentibus praediti. *Folia* pinnata, pro genere majuscula, 3-5.5 cm. longa ; petiolus 2-4 mm. longus, saepe vix distinctus ; rhachis 2.5-4.5 cm. longus, indumento ei caulis subsimili sed sub lente ut videtur parum glutinoso vestitus, apice in aristam brevem acutam productus ; foliola 9-15-juga, subsessilia, oblique et anguste oblonga (cujusque folii infima linearia, suprema breviter oblongo-falcata), rigida, 4-11 mm. longa, 1-3.5 mm. lata, apice acuta vel subacuta, plerumque (foliis inferioribus exceptis) manifeste falcata, apice antice curvato, basi latere antico parum angustata subrecta latere postico rotundata, in statu sicco brunnea, supra glabra, subtus pilis brevissimis crassis ad costam positis exceptis glabra vel raro subglabra, margine

postico adpresse ciliolata, antice ipso glabra, costa valde excentrica juxta marginem anticum appropinquata etiam fere marginali, nervis secundariis circiter 6-8 basalibus (in foliis infimis paucioribus) costae subparallelis tamquam costa subtus prominulis; stipulae scariosae, castaneae, e basi latiusculo lineari-lanceolatae, acutae, 6.5-9 mm. longae, basi 1.5-2 mm. latae, post folia delapsa persistentes, erectae vel erecto-patentes. *Inflorescentiae* ex axillis foliorum superiorum exorientes, manifeste pedunculatae, satis densae sed haud strobiliformes; pedunculi 1.0-1.7 cm. longi, pilis aureis patentibus brevibus et longis dense vestiti; bractae late ellipticae vel ovato-ellipticae, 4.5-7 mm. longae, medio circiter 2.25-2.75 mm. latae, patentes vel recurvatae, scariosae, longitudinaliter nervatae, extra pubescentes, marginibus ciliatae, apice acutae vel subacutae; pedicelli circiter 4-7 mm. longi, more rhachidis vestiti, apice curvati, ut flos pedicello subrectangulatus sit; bracteolae apice pedicelli positaе, erectae, lanceolato-oblongae vel lanceolatae, 3.5-5.5 mm. longae, 1.1-1.5 mm. latae, extra pubescentes, apice acutae vel subacutae. *Calyx* bilabiatus, labio superiore 9-13 mm. longo pubescente, lobis usque ad  $\frac{2}{3}$  connatis apice paulum oblique subtruncato-rotundatis, labio inferiore 11-13.5 mm. longo trilobato extra ubique pubescente, lobo mediano 4.75-6.5 mm. longo plicato dorso carinato primo recto vel subrecto serius saepe plus minusve curvato circiter 0.75 mm. alto (a latere viso) apice obtuso, lobis lateralibus 5.0-7.5 mm. longis 1.5-2 mm. latis oblongis apice obtusis. *Corolla* calycem parum superans; vexillum 10-12 mm. longum, unguiculatum, unguiculo circiter 3.5 mm. longo, lamina late rotundata circiter 8.5 mm. longa 7.5 mm. lata apice rotundata; alae 11.25-12 mm. longae, unguiculo 2.75 mm. longo, lamina anguste obovato-oblonga 8.75-9.5 mm. longa circiter 2.5 mm. lata apice rotundata parce ciliolata, margine superiore basi lobulo conspicuo retrorsum directo praedito; petala carinae apicem versus cohaerentia, 11.5-12.5 mm. longa, oblique obovato-oblonga, apice rotundata parum erosa, vix sursum curvata, margine superiore basim versus lobulo retrorsum directo praedito. *Stamina* monadelpha, tubo latere ventrali fisso. *Ovarium* praecipue marginibus pubescens, 3-4-ovulatum, inter ovula leviter constrictum, stylo inferne parce pubescente superne glabro. *Legumen* ignotum.

TANGANYIKA TERRITORY. Southern Highlands Province, Njombe District: Njombe, 1829 m., 1 May 1932, *R. M. Davies* D 572 (typus in Herb. Kew.): shrub; yellow flowers; very common. Southern Highlands Province, Iringa District: Ukwama Forest Reserve, 1829-1891 m., July 1929, *L. T. Wigg* 49 (Herb. Imp. For. Inst., Oxon.): gregarious slender-stemmed tree or shrub at highest elevations; vernacular name (Kizungwa) "Mwhéretsi".

***Cassia singueana*** Del. var. **glabra** (*Hutch. ex Bak. f.*) *Brenan*, comb. nov. —*Cassia goratensis* Fresen. var. *glabra* Hutch. ex Bak. f., Leguminosae Trop. Afr. 634 (1930).

var. **flavescens** (*Hutch. ex Bak. f.*) *Brenan*, comb. nov. —*Cassia goratensis* Fresen. var. *flavescens* Hutch. ex Bak. f. *op. cit.* 634-5 (1930).

Ghesquière, in Rev. Zool. Bot. Afric. 26, 132-3 (1935), makes *C. goratensis* var. *flavescens* a synonym of *C. tettensis* Bolle which he retains as a species distinct from *C. singueana*. I am unable to find a satisfactory



correlation between the distinguishing characters that Ghesquière adduces for *C. tettensis*, and I do not consider var. *flavescens* to be more than varietally distinct from *C. singueana*.

***Isoberlinia angolensis*** (Welw. ex Benth.) Hoyle et Brennan, comb. nov.—*Berlinia angolensis* Welw. ex Benth. in Trans. Linn. Soc. **25**, 310 (1865); Oliv. in Oliv., Fl. Trop. Afr. **2**, 296 (1871); Ficalho, Pl. Uteis, 155 (1884); Hiern, Cat. Afr. Pl. Welw. 298 (1896); Harms in Engl., Pflanzenw. Afr. **3**, pt. 1, 469 (1915); Baker f., Leg. Trop. Afr. 68 (1930). *B. angolensis* var. *subcordata* Welw. ex Oliv., l.c.; Hiern, l.c.; Harms, l.c.; Baker f., l.c. *Westia angolensis* (Welw. ex Benth.) Macbr. in Contrib. Gray Herb. n.s. **59**, 21 (1919).

We have seen material of *I. angolensis* which we regard as typical from Angola (*Welwitsch* 568, type of the species in Herb. Mus. Brit., *Gossweiler* 1339, 9507) and N. Rhodesia (*B. D. Burtt* 5892). Our specimens from the Anglo-Egyptian Sudan (*Hoyle* 815 (flowers), 816 (sapling), 817 (fruit)) differ in having the leaflets decidedly acuminate at apex, and probably represent a distinct variety, but the mature material at present available is not such that a new group can confidently be based upon it.

After careful examination of the type of var. *subcordata* Welw. ex Oliv. (*Welwitsch* 569, in Herb. Kew.) in conjunction with other material of the species, we consider that the characters attributed to this variety are insufficiently constant, and that it is not worth retaining.

In Tanganyika Territory and Nyasaland there occurs a plant described by Baker as *Berlinia densiflora* and by Harms as *B. stolzii*. This is clearly very closely related to *I. angolensis*, differing merely in the hairy calyx-tube, and we do not consider it specifically distinct; we therefore describe it below as var. *lasiocalyx*. In addition to the specimens cited below under the new variety, there are certain others which, although sometimes sharing the character of the hairy calyx-tube, appear intermediate (and may be hybrids) between *I. angolensis* and *I. tomentosa* (Harms) Craib et Stapf in other characters, notably the shape of the calyx-tube and the texture and indumentum of the leaves. Examples are *Baroness Nolde* 355 b from Quela, Angola (Herb. Mus. Brit.) and *Milne-Redhead* 2995 from Mwinilunga, N. Rhodesia (Herb. Kew.).

***Isoberlinia angolensis*** var. ***lasiocalyx*** Hoyle et Brennan, var. nov.—*Berlinia densiflora* Baker in Kew Bull. 1897, 265; Harms, l.c.; Baker f., l.c. *Berlinia stolzii* Harms in Engl. Bot. Jahrb. **53**, 465 (1915), et in Engl., Pflanzenw. Afr. **3**, pt. 1, 469 (1915); Baker f., l.c. *Isoberlinia densiflora* (Baker) Milne-Redhead in Kew Bull. 1937, 415; Jackson in Journ. S. Afr. Bot. 1940, 40; a planta typica calycis tubo plus minusve dense pubescenti vel praesertim in sulcis longitudinalibus tomentoso differt.

The epithet *densiflora* is not used for our new variety, because the character to which it refers is not diagnostic; there is no compulsion to adopt it, since it has not been used in varietal rank.

TANGANYIKA TERRITORY. Southern Highlands Province, Mbeya District: Mbosi, 1465–1705 m., 29 Mar. 1932, *G. W. St. Clair Thompson* 1053 (Herb. Kew., Herb. Imp. For. Inst., Oxon.):—large tree to 15, sometimes 16.5 m.; on red gneissic soil, acid but fertile, associated with *Uapaca kirkiana*, *U. zanzibarica*, *Isoberlinia globiflora*, *Brachystegia utilis*

and *Parinari mobola* ; dominant over considerable areas (to N. Rhodesian border) on this type of soil : vernacular name (Chinyika) "Mtonto". Rungwe District : *Stolz* 1957 (type-number of *B. stolzii*, Herb. Kew., Herb. Mus. Brit., Herb. Imp. For. Inst., Oxon.). Tukuyu to Massoka road, 945-1190 m., 23 Mar. 1932, *G. H. St. Clair Thompson* 1304 (Herb. Kew., Herb. Imp. For. Inst., Oxon.) :—tree to 12 m., usually 9-10.5 m. here ; bark red on cutting ; flowers cream-coloured ; in woodland of *Brachystegia*, *Isobertinia*, *Uapaca* spp. (including *U. kirkiana*), with *Phyllanthus* sp. and *Smilax kraussiana* undergrowth ; fair grass growth at upper limit with *Pteridium* ; on good red gneissic soil on rather steep slopes ; dominant or codominant on these hills. Without precise locality, *L. T. Wigg* 437 (Herb. Imp. For. Inst., Oxon.) :—vernacular name "Mulembera".

NYASALAND. Northern Province, North Nyasa District : Nyika Plateau, 1830-2135 m., June 1896, *A. Whyte s.n.* (type of var. *lasiocalyx* and of *Berlinia densiflora*, Herb. Kew.) :—tree of medium size.

The following specimen from Tanganyika Territory, although in the fruiting stage and therefore not determinable with certainty, probably belongs here :—Southern Highlands Province, Mbeya District : Mbozi, 1550 m., 29 Aug. 1933, *P. J. Greenway* 3626 (Herb. Kew., Herb. Imp. For. Inst., Oxon.) :—a much branched tree to 9 m., beginning to flower and bear fruit when about 3 m. high ; codominant in places in *Brachystegia-Uapaca* woodland ; a good firewood tree : vernacular name (Chinyika) "Matonto".

A. C. HOYLE & J. P. M. BREMAN.

#### ROSACEAE.

**Hirtella zanzibarica** Oliv. ; Brenan in Trop. Woods No. 86, 5-11 (1946).

Mr. P. J. Greenway kindly sent on loan the material of this species from the Herbarium of the East African Agricultural Research Institute, Amani, Tanganyika Territory. Included are two specimens of *H. zanzibarica*, formerly labelled "*Acioa spec.*", from the Sachsenwald near Dar-es-Salaam, which are the first that I have seen from the mainland of Tanganyika Territory and are quite probably the basis of the record of *Acioa goetzeana* Engl. from this locality (see Brenan, *op. cit.* 10-11). The following specimens are additional to those previously cited (*l.c.*).

TANGANYIKA TERRITORY. Eastern Province, Uzaramo District : Sachsenwald, without date, *Holtz* 545 (Herb. Amani) : vernacular name "Moana". Same locality, 3 Aug. 1902, *Holtz* 645 (Herb. Amani) :—"Baum II Gr." Without locality or date, *Holtz* ? G 6913 (Herb. Amani).

PORTUGUESE EAST AFRICA. Malema Valley, 13 Sept. 1941, *A. J. Hornby* 2229 (Herb. Amani) :—large tree in ground water forest in dry rocky bed.

#### MYRTACEAE.

**Syzygium sclerophyllum** Brenan, sp. nov. ; *S. masukuensi* (Baker) R. E. Fr. affine, ramulis manifestius quadrangularibus, foliis etiam

crassius coriaceis ellipticis basi cuneatis nec oblongis vel ovato-oblongis basi rotundatis, marginibus insigniter revolutis, costa supra profundius atque angustius impressa, reticulo nervorum venarumque supra omnino obscuro subtus denso et prominente distat.

*Arbor* magna, glabra. *Ramuli juveniles* subcompressi, quadrangulares, angulis acutis vel saepe anguste subalatis, validi, 2-3.5 mm. diametro, siccitate fusco-brunnei; vetustiores fulvo-brunnei, cortice desquamante; internodia 1.5-4 cm. longa. *Folia* crasse ac rigidissime coriacea, elliptica usque late elliptica, apicem ipsum obtusum versus dimidio vel triente superiore aequabiliter angustata, nonnunquam (in foliis e nodis inferioribus innovationum ortis) ad apicem rotundata, basi plerumque late cuneata et in petiolum breviter decurrentia, 2.5-6 cm. longa, 1.6-3.4 cm. lata, supra opaca siccitate obscure olivaceo-brunnea, subtus plerumque hebeter atque obscure purpureo-brunnea, margine insigniter revoluti; costa supra profunde impressa canaliculum valde angustum efficiens, subtus prominens, 0.75-1.5 mm. lata, nervis lateralibus primariis utroque costae latere circiter 12-15 subrectis sed a secundariis numerosis subparallelis aegre discriminandis; venuli ultimi conferte areolato-anastomosantes, velut nervi laterales supra impressiusculi nisi sub lente non conspicui, subtus modice prominentes et praeterea colore quidpiam obscuriore manifesti; petiolus 3-5 mm. longus, 1.5-2 mm. diametro, rugosus, supra canaliculatus. *Inflorescentiae* ramulos terminantes, supra folia suprema (bracteas) sessiles, obpyramidato-corymbosae vel nonnunquam ovoideae, 2.5-4 cm. longae, circiter 3-5 cm. latae, basi trichotomae; axes primarii validi, tetragoni, 1.25-3 mm. diametro, 1-2 cm. longi, siccitate pulli, axe medio plerumque bis iterum trichotomo, lateralibus semel trichotomis. *Flores* apice axium ultimarum complures glomeratae, subsessiles. *Alabastra* circiter 6 mm. longa, 4 mm. lata. *Receptaculum* (calyce incluso) obconicum, 6 mm. longum, apice 4-5 mm. diametro, extra leviter angulatum, supra ovarium ad 3 mm. cupulatum productum. *Calycis* lobi 4, erecti, late rotundati, 1.7 mm. longi, basi 2-2.5 mm. lati. *Petala* 4, mox calyptratim caduca, corcava, suborbicularia, circiter 4.5 mm. longa, 5 mm. lata, vix unguiculata. *Stamina* numerosa, filamentis 6-8 mm. longis crassiusculis basi 0.6-0.75 mm. latis ob cellulas prominentes sub lente subtilissimis papillosis, apice valde angustatis; antherae breviter oblongo-ellipticae, 1 mm. longae, paulum infra connectivi apicem glandula parva rotundata rubida instructae. *Stylus* 6 mm. longus, basi 0.75 mm. crassus, apice attenuatus. *Fructus* ignotus.

TANGANYIKA TERRITORY. Tanga Province, Korogwe District: Magamba, W. Usambaras, 1700 m., Jan. 1932, L. T. Wigg 88 (*Forest Herbarium* No. 772) (typus in Herb. Kew., Herb. Imp. For. Inst., Oxon.):—large tree of temperate rain forests, damper sites: vernacular name (Shambaa) "Mshiwi". Magamba Forest, Usambaras, 1524 m., Dec. 1926, C. L. Bancroft 346 (Herb. Imp. For. Inst., Oxon.):—timber tree.

This species is striking on account of its rather small but remarkably hard and rigid leaves with conspicuously recurved margins; the venation is also distinctive, being not or scarcely visible to the naked eye on the upper surface, while beneath it is close, fine and prominent.



The following specimen, also from Tanganyika Territory, is close to *S. sclerophyllum* in leaf shape and texture but differs in the venation ; it is too inadequate to be determined with certainty :—Southern Highlands Province, Iringa District : Ihangana Forest, 2134 m., 7 Oct. 1937, C. J. W. Pitt-Schenkel 1016 (the number 567 also occurs on the label) (Herb. Imp. For. Inst., Oxon.) :—tree 18–22 m. ; fairly straight bole, with spiral markings ; reddish-brown bark ; timber brown, hard : vernacular name (Kihehe) “ Mqualiti”.

#### RUBIACEAE.

**Polysphaeria** (§ *Stegnanthae* Brenan, vide infra) **dischistocalyx** Brenan, sp. nov. ; subsimilis ac fortasse affinis *P. nerifoliae* K. Schum. et *P. multiflorae* Hiern, ab ambabus calyce extra plus minusve puberulo, lobis corollae acutis, ab omnibus speciebus generis adhuc descriptis bracteolis calyptriformibus, calyce majore satis profunde bilobato insigniter differt.

*Frutex* 2–6 m. altus, ramulis gracilibus glabris plus minusve leviter compressis et sulcatis infra nodos complanatis dilatatisque. *Stipulae* mox caducae, e basi late triangulari 1.5 mm. longa 2.5 mm. lata abrupte acuminatae, acumine 1 mm. longo. *Folia* lanceolata vel oblongo-lanceolata, apice attenuata vel acuminata, obtusa usque acuta, basi acute cuneata vel nonnunquam rotundato-cuneata, 5.4–16.6 cm. longa, 2–4.9 cm. lata (infra ramulos nonnunquam reducta, parva, suborbicularia usque oblongo-lanceolata), chartacea usque tenuiter coriacea, glabra, nitidula, siccitate brunnea, costa supra paulum impressa subtus prominente, nervis primariis utroque latere costae circiter 7–12 sed a secundariis haud bene distinctis sub angulo lato patentibus subrectis ad marginem versus bifurcatis atque arcuato-anastomosantibus, rete venularum utrinque prominulo ; petiolus 5–8 mm. longus, siccitate nigricans, supra canaliculatus. *Inflorescentiae* axillares, sessiles, glomerati, multiflorae, circiter 1.2 cm. diametro. *Flores* sessiles, bracteolati ; bracteolae inferiores in cupulam scariosam irregulariter bilobatam circiter 1.5–2 mm. altam extra puberulam margine albido-ciliatam connatae, superiores in calyptram ovoideam scariosam circiter 4.5–5 mm. longam 2.75–3 mm. latam extra puberulam intus strigoso-hirsutam apice rostello curvato coronatam primo clausam serius irregulariter atque oblique circumscissilem vel nonnunquam in lobos 2 longitudinaliter fissam hinc calycem recludentem omnino connatae. *Calyx* alabastro clausus, brunneus, scariosus, extra omnino densiuscule vel praesertim apicem versus tantum sparse puberulus, intus strigoso-sericeus, forma ac mensura calyptrae bracteolari similis, serius apertus, bilobatus, 4–5.5 mm. longus, tubo 1.5–2.5 mm. longo, lobis late ovatis 2.25–3 mm. longis basi circiter 3.25–3.5 mm. latis apice apiculatis. *Corolla* alabastro circiter 6 mm. longa, obovoidea, acuta, extra puberula vel glabra, sub anthesin tubo 3.5–4.75 mm. longo sursum ampliata atque ibi ad circiter 2.5–3.5 mm. lato intus circa et supra staminum insertionem dense ac conspicue albido-villoso, lobis ut videtur patentibus ovato-triangularibus 2.5–2.75 mm. longis basi 1.7–2 mm. latis intus glabris apice acutis. *Stamina* filamentis 1 mm. longis, antheris 2.5 mm. longis. *Stylus* circiter 6.5 mm. longus, basi excepta dense pubescens, apice bifidus. *Fructus* globosus, glaber, ut videtur laevis, circiter 6–8 mm. diametro, calyce persistenti coronatus.

TANGANYIKA TERRITORY. Eastern Province, Ulanga District : Umgebung der Station Mahenge, Tabora, 900-1000 m., 23 Dec. 1931, *H. J. Schlieben* 1567 (Herb. Kew., Herb. Mus. Brit.) :—Parklandschaft, Bachufer, häufiger Strauch 4-6 m. ; Blüte weiss. Southern Highlands Province, ? Rungwe District : Kibila R., 6 July 1912, *A. Stolz* 1429 (Herb. Kew.) :—Strauch 2 m. ; Bl. weissl. rosa ; Blätter frisch grün, glänzend. Kilambo, 6 Mar. 1913, *A. Stolz* 1911 (Herb. Kew., Herb. Mus. Brit., Herb. Imp. For. Inst., Oxon.) :—strauchartig, 4 m. ; Bl. weiss : "Mwosukulu" (=vernacular name ?). Southern Highlands Province, Njombe District : Flussufer im Rumbira-Thal bei Langenburg, c. 500 m., Apr. 1892, *Goetze* 861 (Herb. Kew.) :—vernacular name "Kabare-bare".

NYASALAND. Northern Province, North Nyasa District : Mwanemba, Nyika Plateau, 2440 m., Feb.-Mar. 1903, *J. McClounie* 151 (typus in Herb. Kew.). Stream-bank near Ntalire, *W. E. Lewis* 121 (Herb. Imp. For. Inst., Oxon.).

This very distinct species superficially resembles *P. neriifolia* K. Schum. and *P. multiflora* Hiern, and has been repeatedly misidentified with the former. *Goetze* 861 (cited above) was published under *P. neriifolia* by K. Schumann in the enumeration of *Goetze's* plants collected in S.W. Tanganyika Territory, in Engl. Bot. Jahrb. **30**, 414 (1901). The Kew sheet of this number is localised merely as "Livingstone-Gebirge" ; in the citation above I have given the fuller and more precise locality from the enumeration referred to.

The interesting morphology of the young flower-bud in *P. dischistocalyx* appears to be anomalous in the genus, the closed calyx being itself enclosed by a calyptra of entirely connate bracteoles, and the calyptra itself surrounded at its base by an irregular cupule. The closed calyx recalls that of *Tricalysia pachystigma* K. Schum., but here there is no bracteolar calyptra. It is just possible that the calyx of *P. pedunculata* K. Schum. in De Wild., Études Fl. Katanga, 226-7 (1903), from Katanga, Belgian Congo, may be similar to that of our plant, but Schumann's description, from which alone *P. pedunculata* is known to me, is insufficient to decide this point. Our plant clearly cannot be conspecific with *P. pedunculata*, for the latter is described as a tree with persistent stipules, pedunculate inflorescences, a calyx 0.5 mm. long irregularly trifid after anthesis, reflexed corolla lobes, and a style twice as long as the corolla.

After the flowers have expanded, the conspicuously bilobed calyx characterises *P. dischistocalyx* excellently. When the calyx lobes are viewed with transmitted light, it is seen that there is no central midrib to the lobe, but that two nerves of approximately equal thickness converge at the apex, where two diminutive denticles may sometimes be seen. This suggests that each apparently single calyx lobe may be interpreted morphologically as two lobes marginally fused. The two nerves are sometimes at least not equidistant from the margin and it thus seems probable that the actual lines of splitting between the lobes do not necessarily correspond with the hypothetical "true" lobe margins.

The species as here defined does not seem to be very variable. I do not consider the differences in the mode of splitting of the bracteolar calyptra noted in the description to be significant. It seems likely that

the formation of two longitudinal lobes may be the normal method and the irregularly transverse slit may be the result of pressure during drying on unopened calyptrae, especially since the latter appear to be very thin and fragile. The variation in the indumentum of the outside of the calyx and corolla is too slight for much importance to be attached to it.

In addition to the specimens already cited under *P. dischistocalyx*, certain further specimens from Tanganyika Territory require mention here: Bei Mukumi am Ruhembe, in einer Niederung auf schwarzem Boden, 500 m., Dec. 1898, Goetze 389 (Herb. Kew.); Mpwapwa, 1070 m., 17 Dec. 1930, Hornby 335 (Herb. Imp. For. Inst., Oxon.):—stream side; 6 m. tall. The former was determined as *P. multiflora* Hiern by K. Schumann in Engl. Bot. Jahrb. 28, 492 (1900), from which source I have taken the full locality; the latter has been labelled as *P. schweinfurthii* Hiern. Their relationship is, however, clearly with *P. dischistocalyx*, since their calyces are closed in bud and become bilobed at anthesis. The bracteoles in neither specimen appear to be calyptriform, but open and laxly surrounding the calyx from an early stage in the development of the buds: in addition the unopened calyces are not rostellate at apex, and in Hornby 335 the inflorescences are very shortly pedunculate. Two collections in the Herbarium of the British Museum (Hiwaga, Kilosa subdistr., 4 June 1921, C. F. M. Steymerton 734, and Kilosa, 25 Nov. 1922, C. F. M. Steymerton 735) agree with Hornby 335 except that the inflorescences are sessile, but I believe that they are conspecific. It is likely that the last three specimens at least may represent a new species related to but distinct from *P. dischistocalyx*. At present it seems better to leave them undetermined in the hope that future collections from these parts of Tanganyika will enable their status to be settled more satisfactorily.

**Polysphaeria** (§*Dolichocalycinae* Brenan, vide infra) **macrantha** Brenan, sp. nov.; nulla affinitate arcta obvia, inter congeneres floribus maximis calyce sub anthesin unilateraliter fisso perinsignis.

*Arbor* parva, sempervirens, usque ad 10 m. alta, ramulis satis validis elongatis usque ad 35 cm. longis vel ultra glabris juventute compressis et sulcatis in statu sicco nigris vel atropurpureis, internodiis usque ad 6.5 cm. longis. *Stipulae* caducae vel persistentes, triangulares vel ovato-triangulares, 3.5–6.5 mm. longae, basi 3.5–5 mm. latae, apice breviter (0.5–1 mm.) mucronatae, extra puberulae et dorso carinatae, intus glabrae sed basi glandulis (?) numerosis crasse piliformibus praeditae. *Folia* ovato-oblonga usque oblongo-lanceolata vel elliptica, apice attenuata vel subacuminata, obtusa usque acuta, basi rotundata vel late cuneata (5.5–) 9.5–17 cm. longa, (1.7–) 3–6.8 cm. lata (infra ramulos nonnunquam reducta, parva, late elliptica), chartacea vel rigide chartacea, glabra, nitidula vel opaca, subtus in statu sicco saepius brunnea, costa supra plerumque paulum impressa subtus prominente, nervis primariis utroque costae latere circiter 8–11 leviter arcuatis vel rectis et prope marginem arcuato-anastomosantibus, rete venularum conferto utrinque sed praesertim subtus prominulo; petiolus (4–) 6–10 mm. longus, 1–2 mm. crassus, siccitate plerumque nigrescens, supra sulcatus, subtus rotundatus. *Inflorescentiae* axillares, saepius pedunculatae sed nonnunquam sessiles vel subsessiles, 2–4-florae; pedunculus 0–11 mm. longus, compressus, breviter ac dense vel parcius pubescens, apice pare



bractearum 2-4 mm. longarum, late ovatarum vel triangularum apice acutarum vel acuminatarum extra more pedunculi indutarum intus dense ac appresse pubescentium instructus. *Flores* sessiles vel pedicellati, pedicellis usque ad 9 mm. longis, basi 1-2 paribus bracteolarum praediti; bracteolae more bractearum indutae, irregulariter cupulatum connatae, saepe obliquae, circiter 3-7 mm. longae. *Calyx* pro genere maximus, firmus, siccitate nigrescens, alabastro oblongo-ellipsoideus vel elongato-suburceolatus, corollam omnino aut fere omnino obtegens, circiter 7-13 mm. longus, medio 3-5 mm. diametro, os 1-3 mm. diametro versus gradatim angustatus et ibi irregulariter denticulatus, dentibus saepe 4 triangularibus 1-2 mm. longis, serius sub anthesin plus minusve profunde unilateraliter fissus, extra inferne glaber superne plus minusve furfuraceo-puberulus, intus densissime adpresse pubescens. *Ovarium* obconicum, glabrum, 2.5 mm. altum, apice 2 mm. diametro, biloculare, loculis uniovulatis. *Corolla* etiam pro genere maximus, albus, alabastro circiter 1-1.4 cm. longus, extrinsecus glaber, sub anthesin tubo 1-1.1 cm. longo basi 1.5-2 mm. diametro apicem versus ampliatus intus circa et supra staminum insertionem dense villosus, lobis ut videtur patentibus ovato-oblongis circiter 1.2 cm. longis 5 mm. latis intus glabris apice acutis. *Stamina* filamentis brevissimis antheris 7.5 mm. longis. *Stylus* 2.3 cm. longus praeter basim densiuscule pubescens, apice bifidus. [*Fructus* (e spec. n. 483 descriptus: vide infra) globosus, glaber, in statu sicco obscure ac longitudinaliter nervosus, circiter 1.2 mm. diametro, calyce persistenti coronatus.].

TANGANYIKA TERRITORY. Tanga Province, Korogwe District: "m. Arb." (probably from this district), 5 Jan. 1917, *Zimmermann* s.n. (typus in Herb. Kew.). Amani, 1 Feb. 1917, *Zimmermann* G 7880 (Herb. Amani). Sangarawe-Monga, 7 Mar., *Zimmermann* G 7881 (Herb. Amani), s.n. (Herb. Kew.). Amani, 7 Mar. 1922, *R. Soleman* 5973 (Herb. Amani, Herb. Kew., Herb. Mus. Brit., Herb. Imp. For. Inst., Oxon.). Monga, 1035 m., 26 Jan. 1939 *P. J. Greenway* 5830 (Herb. Imp. For. Inst., Oxon.):—A much branched evergreen tree up to 9 m. h., with clusters of white flowers; a local understorey tree in *Cynometra*, *Isobertia scheffleri*, *Piptadenia buchanani*, *Anisophyllea obtusifolia* evergreen rain forest on a steep mountain slope, not common. [Western Province, Tabora District: Simbili Forest, *Tanganyika Territory Forest Herbarium* No. 483 (Herb. Imp. For. Inst., Oxon.) ?]

The extraordinary elongate calyx, its dark, glabrous lower part contrasting strongly with the densely grey-pubescent bracteoles from among which it projects, give this most distinct species a singular appearance even when in bud. The teeth are very shallow in comparison with the size of the calyx, and its mouth seems too small to allow the corolla fully to emerge; nevertheless the corolla pushes its way out, normally causing the calyx to become slit more or less deeply down one side. The corolla itself is more than twice as large as any hitherto described in this genus. The only fruiting specimen, with a single fruit that I have been unwilling to sacrifice for dissection, is that from Simbili Forest. In so far as comparison is possible, it seems to agree with the Usambara material, but until confirmatory flowering material is available from Simbili, its identity should only be accepted with doubt. A further reason for this is that it would be surprising for a species otherwise

restricted to the rain forest of the Usambaras to turn up in Tabora District ; it is possible that there has been confusion of labels.

The distinctness of this species requires no further emphasis, but the time seems ripe for reconsidering the subdivision of the genus. The only previous attempt appears to be that of S. Moore who, in Journ. Linn. Soc. Bot. **37**, 307 (1906), while describing a new species from Nyasaland, considered that *Polysphaeria* could be divided naturally into two sections, §*Ephedranthae* with flowers in sessile glomerules, and §*Cladanthae* with stalked inflorescences. With the species then known this classification was not unreasonable, but the variation between stalked and sessile inflorescences in the species described or discussed in the present paper indicates that Spencer Moore's classification may no longer be applied naturally to the whole genus.

Apparently well-defined groups may be recognised on a basis of the morphology of the calyx and the relative development of the calyx and corolla.

(1) In the majority of species in the genus the calyx is short and cupular, not more than 1.2-5 mm. long, and at flowering time truncate or shortly dentate on its margin. The developing corolla projects from the already open calyx from an early stage in bud. This group includes all the species except one described at the time that Spencer Moore wrote in 1906, and his classification may still be conveniently used to subdivide this group further.

(2) In the second group the calyx is longer (4-5 mm.) and entirely conceals the corolla until a late stage in bud. The calyx in this state is ovoid or ellipsoid and either entirely closed or with only a minute aperture at the top. At flowering-time the calyx splits into two deep lobes, each lobe corresponding to two connate calyx-teeth. The corolla, as in group 1, is small.

(3) In the third group the calyx is very long (7-13 mm.) and, as in group 2, until an advanced stage in bud conceals the corolla except often for its tip which may project from the small but well defined mouth of the calyx. At this stage the calyx is oblong-ellipsoid or elongate-suburceolate. The corolla is much larger than in either of the preceding groups.

The following formal classification is therefore proposed :—

Sect. **EPHEDRANTHAE** S. Moore (including Sect. *Cladanthae* S. Moore) ; calyx alabastro apertus, brevis (1.3 mm. longus), cupularis, margine semper truncato vel denticulato ; corolla parva alabastro calycem multum exsuperans. Typus : *P. multiflora* Hiern.

Series CLADANTHAE (S. Moore) Brenan (*Polysphaeria* Sect. *Cladanthae* S. Moore in Journ. Linn. Soc. Bot. **37**, 307 : 1906) ser. nov. ; inflorescentiae plerumque manifeste pedunculatae. Typus : *P. zombensis* S. Moore.

Series EPHEDRANTHAE (S. Moore) Brenan (*Polysphaeria* Sect. *Ephedranthae* S. Moore, l.c.) ser. nov. ; inflorescentiae sessiles vel subsessiles. Typus : *P. multiflora* Hiern.

Sect. **Stegnanthae** *Brenan*, sect. nov. ; calyx alabastro clausus vel tantum foramine apicali minimo praeditus, ovoideus vel ellipsoideus, 4–5 mm. longus, sub anthesin apertus ac profunde bilobatus ; corolla alabastro calyce occulta, parva. Typus : *P. dischistocalyx* *Brenan*.

Sect. **Dolichocalycinae** *Brenan*, sect. nov. ; calyx alabastro ore parvo sed distincto praeditus, insigniter elongatus, 7–13 mm. longus, oblongo-ellipsoideus vel elongato-suburceolatus, sub anthesin plus minusve profunde unilateraliter fissus ; corolla alabastro calyce saepe praeter apicem occulta, magna. Typus : *P. macrantha* *Brenan*.

The following species belong to Sect. *Ephedranthae* Ser. *Cladanthae* :—*P. arbuscula* K. Schum., *P. zombensis* S. Moore. Under Ser. *Ephedranthae* come :—*P. braunii* K. Krause, *P. brevifolia* K. Krause, *P. jubensis* Chiov., *P. lanceolata* Hiern, *P. multiflora* Hiern, *P. neriifolia* K. Schum., *P. parviflora* Good, *P. parvifolia* Hiern, *P. schweinfurthii* Hiern, *P. squarrosa* K. Krause, also probably *P. macrophylla* K. Schum.

Sect. *Stegnanthae* comprises *P. dischistocalyx* *Brenan* and the unnamed species discussed on p. 83. It is likely that *P. pedunculata* K. Schum. should also be placed here. K. Schumann described its calyx as "ellipsoïde avant l'anthèse" (K. Schum. in De Wild., Études Fl. Katanga, 226–7 : 1903), but becoming irregularly trifold afterwards. If this proves to be accurate, the diagnosis of Sect. *Stegnanthae* may require emending ; but I prefer to leave this matter until I have had an opportunity of examining material of *P. pedunculata*.

Sect. *Dolichocalycinae* includes only the type-species, *P. macrantha* *Brenan*. The mention of species in the last three paragraphs must not be taken to imply that I necessarily regard them as taxonomically valid.

Sir J. D. Hooker, when he proposed his new genus *Polysphaeria* in Benth. et Hook. f., Gen. Pl. 2, 108 (1873), mentioned that it included two or three species. Hiern, in Oliv., Fl. Trop. Afr. 3, 127–8 (1877), recognised four species. Of these, *P. lanceolata* Hiern appears to agree most fully and satisfactorily with the original description of the genus, and I therefore propose it as the lectotype-species of *Polysphaeria*. Although the section *Ephedranthae*, as emended here, includes *P. lanceolata* Hiern, it unfortunately does not seem reasonable to choose it as the type-species of the section, since S. Moore defined §*Ephedranthae* as possessing sessile inflorescences, and *P. lanceolata* has them often very shortly pedunculate, though the peduncles are not long enough for *P. lanceolata* to be included in the series *Cladanthae*.

**Psychotria petiginosa** *Brenan*, sp. nov. ; inter *Psychotrias* bacteriophilas (vide clavem cl. Bremekampii in Journ. Bot. 71, 275–277 : 1933) ob nodulos dissitos et corollam intus glabram prope *P. alsophilam* K. Schum. et *P. eickii* K. Schum. et K. Krause ponenda, ab ambabus ramulis pubescentibus, foliis majoribus membranaceis subtus in costa et nervis primariis pubescentibus marginibus haud revolutis nervis lateralibus numerosioribus, corollae tubo extra furfuraceo-puberulo facile distinguenda.

*Frutex*, ramulis hornotinis superne subcompressis pilis flocculosis ferrugineis vel fuscis densiuscule pubescentibus, annotinis striatis pube plus minusve persistenti vestitis. *Stipulae* mox caducae, e basi circiter



3.5–4 mm. longa 3–3.5 mm. lata extra intusque plus minusve ferrugineo-pubescenti bicaudatae, caudis circiter 3.5–4 mm. longis triangulari-linearibus. *Folia* membranacea usque chartacea, oblongo-lanceolata vel plus minusve oblanceolata, apice breviter atque acute vel subacute acuminata vel nonnunquam attenuato-acuta, basi sensim attenuata et in petiolum decurrentia, 7–15 cm. longa, 1.9–4 cm. lata, supra siccitate plerumque obscure viridia glabra, subtus pallidiora griseo-viridia in costa et nervis lateralibus plus minusve ferrugineo- vel fusco-pubescentia aliter glabra, nervis lateralibus utroque costae latere 12–17 sursum arcuatis, his cum costa supra subtusque prominulis plerumque pulchre albidoviridibus : noduli bacteriales his illic in lamina crebre disseminati, parvi, irregulariter angulati, supra paulum elevati sed concolores, subtus nigricantes hinc conspicui ; petiolus 0.5–2.5 cm. longus, more ramulorum vestitus. *Inflorescentiae* terminales, plus minusve ferrugineo-pubescentes, pedunculis 1.4–1.7 cm. longis suffultae, tum trichotomae, 2–2.5 cm. longae, 2–3.5 cm. latae ; ramuli 0.3–1 cm. longi, in axillis bractearum parvarum ferrugineo-barbulati, apice saepius ramulis brevissimis secundariis flores geminos vel trigeminos gerentibus. *Flores* albi, pentameri, dimorphi, alii staminibus exsertis stylo incluso, alii (in planta altera ? aut saltem in inflorescentiis disjunctis) staminibus inclusis stylo exserto ; pedicelli brevissimi, ad 2 mm. longi, puberuli. *Ovarium* biloculare, circiter 1 mm. longum, extra crispe puberulum. *Calyx* cupularis, 5-denticulatus, dentibus triangularibus circiter 0.5–0.75 mm. longis. *Corolla* hypocrateriformis ; tubus 6.5–7 mm. longus, apice circiter 2.5 mm. diametro, extra furfuraceo-puberulus, intus glaber ; lobi ovati vel ovato-oblongi, apice acuti, 3.5 mm. longi, 1.5–2 mm. lati, extra subglabri, intus (sub microscopio visi) densissime ac pulcherrime minute papilloosi. *Stamina* 5, 2 2.5 mm. infra tubi apicem insertae, filamentis glabris, in floribus brachystylis 2.5–3.5 mm. longis, in floribus dolichostylis 0.7 mm. longis ; antherae oblongae, 1.5 mm. longae. *Stylus* glaber, 4.5 mm. longus in floribus brachystylis, 7.5 mm. longus in floribus dolichostylis, stigmatibus 2 circiter 1 mm. longis puberulis. *Fructus* nondum notus.

TANGANYIKA TERRITORY. Tanga Province, Pare District : Kindoroko Forest Reserve, 1525–1830 m., 11 Oct. 1928, *H. R. Herring* 371 (typus in Herb. Kew., Herb. Imp. For. Inst., Oxon.) :—a shrub on forest floor, flowers white : vernacular name “Mgacha”.

Dimorphic flowers have been previously noted in a few African *Psychotriae*, for example in *P. kirkii* Hiern and *P. reptans* Benth. by Hiern in Oliv., Fl. Trop. Afr. 3 (1877), and in *P. kimuenzae* De Wild. and *P. nigrescens* De Wild. by De Wildeman in his enumeration of the genus in Pl. Bequaert. 2 (1924). They are also known among the American species, for Bremekamp, in his description of the genus in Pulle, Fl. Suriname, 4, pt. 1 (1934), states that the flowers are heterostylous and describes such flowers in several species from that region. It is thus clear that the contrast of exserted with included styles or anthers, which has been employed as a character to discriminate species by various writers on the African flora, must be regarded with the utmost caution. Dimorphic flowers will doubtless be found in many more species of African *Psychotriae*, and collectors will do very well to look out carefully for them in the field and to collect illustrative specimens.

## ERICACEAE.

**Agauria salicifolia** (*Comm. ex Lam.*) *Hook. f. ex Oliv.* var. **pyrifolia** (*Pers.*) *Oliv.* subvar. **parvifolia** *Brenan*, subvar. nov. ; a var. *pyrifolia* (*Pers.*) *Oliv.* typica internodiis brevioribus, foliis densius confertis lanceolatis vel elliptico-lanceolatis parvis 2–4 cm. longis 0·7–1·2 cm. latis, inflorescentiis brevioribus 1·5–4 cm. longis differt.

TANGANYIKA TERRITORY. Southern Highlands Province, Njombe District : temperate rain forest remnants above Magoye, Elton Plateau, 26 Sept. 1929, *L. T. Wigg* 73 (typus in *Herb. Kew.*, *Herb. Imp. For. Inst.*, *Oxon.*) :—vernacular name “Mkalati”.

This appears to have a similar relationship to var. *pyrifolia* as subvar. *reducta* Sleumer has to var. *latissima* Engl.

There are two sheets of *Wigg* 73, all quite uniform except for a single short flowering twig on one sheet which is very remarkable in having the twig, petioles and inflorescence axes pubescent (but not glandular), and very coriaceous ovate leaves subcordate or rounded at base. It certainly does not come from the same plant as the rest of the two sheets. According to Sleumer's revision of the genus in *Engl. Bot. Jahrb.* **69**, 374–394 (1938), this fragment keys down to var. *buxifolia* (*Comm. ex Lam.*) Sleumer, of which I have not seen authentic material. The variety has been previously recorded only from Madagascar and Réunion.

## SAPOTACEAE.

**Chrysophyllum bangweolense** *R. E. Fr.* in *Schwed. Rhod.-Kongo Exped.* 254 (1916).

TANGANYIKA TERRITORY. Western Province, Tabora District : Simbo Reserve, Tabora, June 1938, *L. T. Wigg* in *Tanganyika Territory Forest Herb. No.* 1093 (*Herb. Imp. For. Inst.*, *Oxon.*) :—small tree, not very common : vernacular name (Nyam.) “Msebeye”. Tabora Township, Agricultural Officer's garden, 1220 m., Mar. 1946, *F. Hughes* in *Tanganyika Territory Forest Herb. No.* 1264 (*Herb. Imp. For. Inst.*, *Oxon.*, *Herb. Uppsala*) :—small tree, not common, found in miombo forests with an average annual rainfall of 88 cm. : vernacular name (Nyam.) “Msebeye”. Central Province, Singida District : Singida, Rift Escarpment near Maw Hills 1675 m., Oct. 1935, *B. D. Burtt* 5263 (*Herb. Kew.*, *Herb. Imp. For. Inst.*, *Oxon.*) :—thickly-leaved tree 4·5–6 m. high, not common in *Brachystegia microphylla* forests with *Monotes*, etc. Without precise locality, *C. H. N. Jackson* 3 (*Herb. Kew.*) :—vernacular name “Mseweye”.

A portion of the flowering specimen kindly collected by Mr. Hughes in response to my request to Mr. Wigg, was sent to Uppsala for comparison with the type-material of *C. bangweolense*. Dr. R. Santesson, of the Uppsala Universitets Institution för Systematisk Botanik, courteously replied that a careful comparison had been made and that the Tanganyika plant agreed well with the type-material, except that the leaves of the former were slightly narrower, but that this was perhaps due to the fact that the twigs of the type seemed a little older. The mature foliage of the Tanganyika plant collected by Burtt and Wigg shows that the

leaves broaden considerably as they reach maturity, so that the discrepancy does not seem a significant one.

Previously the only record for *C. bangweolense* has been the original one from Kamindas, L. Bangweolo, in Northern Rhodesia (*Fries* 909, 909a).

#### OLEACEAE.

**Jasminum** (§*Trifoliata*) **fraseri** *Brenan*, sp. nov. ; ob indumentum et calycem magnum dentibus brevissimis saepe vix distinctis insigne, *J. wyliei* N. E. Br. speciei natalensi affine, foliis subtus plus minusve pubescentibus, inflorescentiis breviter tomentosis calyce paulo majore dentibus brevioribus differt ; *J. abyssinico* R. Br. etiam affine, indumento calyceque primo visu distinguendum. *J. lanatum* Gilg et Schellenb. sec. Hora in *Burtt Davy, Check-lists For. Trees & Shrubs Brit. Emp.* 5, pt. 1, *Tanganyika Terr.* 109, 265 (1941), non Gilg et Schellenb.

*Frutex* (?) scandens. *Ramuli* hornotini longitudinaliter striatuli, pilis crispis fuscis dense et breviter tomentosi, annotini denique plus minusve glabrescentes. *Folia* opposita, trifoliolata ; petiolus 1.1–1.4 cm. longus, apicem versus geniculatus, praesertim supra pubescens ; petiolus terminalis 1.5–2.3 cm. longus, laterales 3 mm. longi ; foliola ovata, apice obtusa et mucronata, basi late et oblique cuneata vel subtruncata, lateralia 3–4 cm. longa, 2.6–3.1 cm. lata, terminalia majora, 4.5–6.4 cm. longa, 3–4.5 cm. lata, firme chartacea vel subcoriacea, utrinque nitidula, supra costa impressa puberula aliter fere glabra vel pilis perpaucis hic illic conspersis, subtus sparse pubescentia et in axillis nervorum lateralium primarium breviter barbata, nervis lateralibus primariis utroque costae latere 4–6 sub angulo 45°–60° a costa abeuntibus sicut rete venularum utrinque prominulis, costa subtus prominente. *Inflorescentiae* amplae, ad apices ramorum confertae, paniculatae, multiflorae, usque ad 30 cm. longae, 15 cm. latae ; ramuli laterales ex axillis foliorum superiorum trifoliolatorum vel bractearum foliacearum simplicium vel (in regione ramorum et ramulorum distali) squamiformium vel linearum tum 2–3 mm. longarum exorientes ; pedicelli (sicut pedunculi) breviter fusco-tomentosi, ei florum lateralium cujusque dichasii 7–11 mm. longi, is floris terminalis brevior 3–6 mm. longus ; in cymulis unifloris pedunculus cum pedicello 1.2–1.9 cm. longus. *Calyx* campanulatus, insigniter magnus, extra satis dense pubescens vel fere tomentellus, intus apice zona puberula 0.75 mm. alta circumcinctus aliter glaber, 4.5–5 mm. longus, 3.75–4 mm. latus, lobis 4–5 vix conspicuis latissime triangularibus brevissimis circiter 0.4–0.5 mm. longis. *Corolla* speciosa ; tubus latus, superne sensim ampliatus, circiter 1.9 cm. longus, basi 3 mm. apice 4 mm. diametro ; lobi 5 (–6) (ante expansionem more generis imbricati), ovato-elliptici, 8.5–9.5 mm. longi, 6.5–7 mm. lati, apice rotundati et minute mucronulati, extra inferne glabri sed apicem versus minutissime puberuli, intus praesertim ad apicem et os tubi versus minute furfuraceo-puberuli, expansi patentes vel ? subreflexi. *Stamina* 2 (in sola corolla sexlobata 3 !), filamentis 2.5 mm. longis circa medium tubi corollae insertis ; antherae 7 mm. longae, 2 mm. latae, connectivo apice ultra thecas in appendiculam applanatam triangularem subacutam 1.0–1.1 mm. longam 0.9–1.0 mm. latam prolongato. *Stylus* (stigmatate subcapitato incluso) 2.1 cm. longus, glaber. *Loculi ovarii* biovulati. *Fructus* subglabri sed nondum maturi tantum visi.



TANGANYIKA TERRITORY. Southern Highlands Province, Iringa District : Kisinga, Aug.-Sept. 1931, *H. Fraser* 17 (typus in Herb. Kew.) : —climber used in building huts, very strong and durable : vernacular name (Kihehe) "Nyakisegi".

This specimen was at first determined (*e. descript.*) as *J. lanatum* Gilg et Schellenb., a Cameroons species. I have been unable to see the type of this, but a perusal of Gilg and Schellenberg's description (in Engl. Bot. Jahrb. 51, 87-88 : 1913) shows clearly that the Tanganyika plant cannot be conspecific. The description of the young branchlets of *J. lanatum* as "albide lanatis", of the leaflets as tomentose beneath with the midrib and nerves inconspicuous above, and especially of the calyx as only 2.5 mm. long with triangular teeth, shows characters entirely at variance with those of *J. fraseri*. The closest affinity of *J. fraseri* appears to be with *J. wyliei* N. E. Br., a species from Natal, from which it differs especially in the indumentum. The profusion of rather large flowers must make *J. fraseri* a striking and ornamental species when growing.

#### SALVADORACEAE.

**Salvadora persica** L. var. **pubescens** *Brenan*, var. nov. ; ramulis petiolis foliis praesertim subtus axibus et ramis inflorescentiarum molliter et plus minusve dense pubescentibus differt.

TANGANYIKA TERRITORY. Kisigo R. bank, 21 August 1928, *Greenway* 802 (typus in Herb. Kew.) : —shrub 3.6 m. high with straggling branches, very hairy and with red fruits, differing from glabrous specimens with white fruits : leaves and fruits eaten by stock : vernacular name (Kig.) "Mkunkuni".

*Greenway* 802 was presumably collected either in Central Province, Dodoma District, or in Southern Highlands Province, Iringa District. For part of its course the Kisigo R. forms the boundary between the two provinces and districts named, and for the rest it flows entirely through Dodoma District.

There seems to be no difference between var. *pubescens* and normal *S. persica* except for the indumentum. The leaves of *Greenway* 802 are all  $\pm$  emarginate at the apex, but this appears to be probably an abnormal development, for similar leaves occur sporadically among those with normal apices on specimens of typical *S. persica*. I fail to understand the reference to white fruits in the field notes. In all the descriptions of *S. persica* to which I have referred the colour of the ripe fruit, where mentioned, is said to be red or dark purple.

*Greenway* 802 has been previously labelled "*Salvadora pubescens* Planch. (*S. persica* var. *pubescens*)", and this is apparently the basis for the mention of "*Salvadora pubescens* Planch." in Check-lists For. Trees & Shrubs Brit. Emp. 5, pt. 1 (Tanganyika Terr.) 165, 249 (1941, but dated 1940). The binomial attributed to Planchon is unmentioned in the Index Kewensis, nor have I found any mention of it in other literature. Equally, *S. persica* var. *pubescens* does not appear to have been previously published.

In spite of the vast geographical distribution of *S. persica*, all the specimens seen from elsewhere are glabrous, and the numerous floras in

which this species is described are united in describing the plant as glabrous : the occurrence of an apparently rare and local pubescent variety is thus of some interest. It may be noticed that Schweickerdth has described (*Bothalia* 3, 248 : 1937) a new species, *S. australis*, which is also pubescent and said to differ from *S. persica* in anther-size, a columnar style, and more deeply lobed calyx ; the plant described here, as has already been remarked, appears to differ in no way from normal *S. persica* except in the indumentum. Our plant also diverges from *S. australis* in the differently shaped and much broader leaves.

#### BORAGINACEAE.

***Cordia balanocarpa*** Brenan, sp. nov. ; species insignis, fortasse affinis *C. ovali* R. Br., petiolis brevioribus, foliis pro rata angustioribus, haud ovatis usque suborbicularibus, supra haud asperis, marginibus praesertim juventute recurvis, nervis lateralibus numerosioribus, inflorescentiis congestis paucifloris, calycis fructiferi forma primo visu distat ; necnon a *C. dioica* Boj. ex DC. et *C. quarensi* Gürke similiter recedit.

*Frutex* deciduus, usque ad 4·6 m. scandens (ex Burtl.). *Ramuli* rigidi, cortice griseo leviter longitudinaliter striato obtecti, juventute plus minusve densiuscule pubescentes, demum postea glabrescentes. *Folia* juventute subtus dense pubescentia vel tomentella, marginibus insigniter revolutis, adulta siccitate rigida, subcoriacea vel coriacea, in forma variabilia, elliptica usque oblonga obovato-elliptica vel subobovato-oblonga, apice leviter emarginata vel nonnunquam rotundata, basi cuneata vel leviter rotundata, 3–10 cm. longa, 1·3–3·8 cm. lata (plerumque circiter 6·9 : 2·3 cm.), supra nitidula laevia vel vix scabrida costa impressa et nervis lateralibus plus minusve subimpressis pubescentibus exceptis subglabra, reticulo venarum prominulo, subtus praesertim in costa et nervis lateralibus prominentibus pilosula, rete venularum et venis transversis prominulis, nervis lateralibus utroque costae latere 6·9 adscendentibus ; petiolus brevis, 3–6 mm. longus, supra sulcatus, plus minusve pilosulo-pubescent. *Inflorescentiae* terminales vel ramos laterales breves terminantae, congestae, pauciflorae, floribus sollemniter 3·8 subsessilibus (pedicellis 1·1–5 mm. tantum longis tomentellis). *Alabastra* anguste obovoidea, apice rotundata, extra tomentella, circiter 6·7 mm. longa. *Calyx* sub anthesi 6–9 mm. longus, basi obtusus, primo superne gradatim ampliatus et apice 3 mm. diametro, serius (ovario fecundato accrescente) ovoideo-urceolatus, incrassatus, supra basim 4–5·5 mm. et ore circiter 3 mm. latus, tubo haud sulcato extra dense pubescenti, lobis irregularibus saepe late triangularibus apice rotundatis vel plus minusve crosis circiter 1·5–2 mm. longis. *Corolla* pallide ochroleuca ; tubus subcylindricus, prope basim parum ampliatus, circiter 8 mm. longus, superne circiter 1·5 mm. diametro, extra glaberrimus, intus superne pilosulus ; lobi 4·5, ut videtur sub anthesi reflexi, glabri, obovato-oblongi vel subrhomboidei, 7 mm. longi, 3 mm. lati, apice obtusi. *Stamina* fauce inserta, filamentis brevibus 2·5 mm. longis pilis nonnullis obstitis ; antherae exsertae, ellipsoideae, 1·25 mm. longae, 1 mm. latae. *Ovarium* fecundatum late ovoideo-conicum, circiter 5·5 mm. altum, supra basim circiter 4 mm. latum, glabrum. *Stylus* filiformis, circiter 5 mm. longus, apice bifurcatus, ramis iterum furcatis, ramulis



J.S. SHAW.

*Cordia balanocarpa* Brenan

1, flowering branchlet,  $\times \frac{1}{2}$ . 2, fruiting branchlet,  $\times \frac{1}{2}$ . 3, single leaf to show variation,  $\times \frac{1}{2}$ . 4, flower in vertical section,  $\times 5$ . 5, young fruit with calyx partly removed,  $\times 5$ . 6, ovary in transverse section,  $\times 10$ . 7, mature fruit in transverse section (mesocarp apparently much shrunk and distorted),  $\times 10$ .



filiformibus. *Calyx in statu fructifero* valde accrescens, lignosus, cyathiformis, extra puberulus, 1.2-1.5 cm. diametro, 8-9 mm. altus, margine parum eroso haud vel vix lobato nisi post fructum ipsum casum, fructus basim arcte amplexans et querci cupulam glandem capientem simulans. *Fructus* ipse monospermus, succulentus, demum durescens (lectoris fide), late ovoideus vel subglobosus, 1.2-1.6 cm. longus, 1.1-1.6 cm. crassus, glaber, apice depresso, styli basi persistenti saepe coronatus.

TANGANYIKA TERRITORY. Lake Province, Shinyanga District: Shinyanga, Sanui Bush, 1160 m., March 1936 (fruit), *B. D. Burtt* 5654 (Herb. Kew., Herb. Imp. For. Inst., Oxon.):—a woody straggling plant with large fruits and dark green leaves; in thickets in grey soil "hard-pan" country. Central Province, Singida District: near Matelele, in *Commiphora* *Lannea* short grass, 1160 m., 16 March 1928 (fruit), *B. D. Burtt* 1412 (Herb. Imp. For. Inst., Oxon.):—vernacular name (Kinyaturu) "Mlulu". Kondoa District: Kunuse, 19 Dec. 1927 (buds), *B. D. Burtt* 903 (Herb. Imp. For. Inst., Oxon.):—vernacular name (Kinyamwezi) "Mushela". Sambala, in mbugas supporting *Lannea humilis*, *Grewia bicolor*, *Dalbergia melanoxylon*, 11 March 1929 (fruit), *B. D. Burtt* 1961 (Herb. Imp. For. Inst., Oxon.). Dodoma District: Kazikazi, in *Commiphora* *Combretum* *Ficus* savannah-bush with scattered thickets, 1220 m., 20 July 1933 (fruit), *B. D. Burtt* 4972 (Herb. Imp. For. Inst., Oxon.):—deciduous, woody, scandent shrub to 4.6 m.; acorn-like fruits, of soft and jelly-like texture when ripe, hardening with age, eaten by fruit-eating birds and by natives; common. Same locality, in grey clay, shallow, alluvial valleys, "hard-pan", in small thickets of *Commiphora*, 1220 m., 29 Oct. 1933 (flowers and old fruiting calyces), *B. D. Burtt* 5039 (typus in Herb. Kew., Herb. Imp. For. Inst., Oxon.): woody climber to 4.6 m. over island thicket shrubs; flowers pale cream-coloured; common.

#### CONVOLVULACEAE.

***Ipomoea macrosepala*** Brenan, nom. nov. — *Argyria* ? *macrocalyx* J. G. Baker in Kew Bull. 1894, 67. *Ipomoea macrocalyx* (Baker) Hallier f. in Engl. Bot. Jahrb. 28, 51 (1899), non Choisy in DC. Prodr. 9, 362 (1845).

*Ipomoea hanningtonii* (Baker) Rendle has been sunk under *Ipomoea macrocalyx* (Baker) Hallier f. as var. *decalvata* Hallier f. (l.c.). I follow Rendle in Fl. Trop. Afr. 4, pt. 2, 182 (1905) in considering it specifically distinct.

#### THYMELAEACEAE.

***Lasiosiphon latifolius*** (Oliv.) Brenan, comb. nov. — *Arthrosolen latifolius* Oliv. in Trans. Linn. Soc. ser. 2, 2, 348 (1887). *L. hildebrandtii* Vatke ex Engl., Hochgebirgsfl. Trop. Afr. 310 (1892), in obs., nomen nudum (fide Pearson), non Scott-Elliott in Journ. Linn. Soc. 29, 47 (1891). *L. vatkei* Engl. in Engl. Bot. Jahrb. 17, 167 (1893), nomen nudum; ex Pearson in Thiselton-Dyer, Fl. Trop. Afr. 6, pt. 1, 228 (1910), cum descr. *Gnidia vatkeana* Engl. et Gilg in Engl. Bot. Jahrb. 19, 267 (1894). *G. latifolia* (Oliv.) Gilg in Engl. Pflanzenw. Ost-Afr. C, 283 (1895).

## LORANTHACEAE.

**Loranthus aurantiaciflorus** Brenan, nom. nov. — *Loranthus aurantiacus* Engl. in Engl. Bot. Jahrb. **20**, 124 (1894), non A. Cunn. ex Hook. in Mitch., Journ. Exped. Trop. Austral. 101 (1848).

**Loranthus celtidiformis** Brenan, nom. nov. — *Loranthus celtidifolius* Engl. in Engl. Bot. Jahrb. **20**, 123 (1894), non Willd., ex J. A. et J. H. Schult. Syst. **7**, 161 (1829).

## EUPHORBIACEAE.

**Macaranga** (§ *Javanicae* Pax et K. Hoffm.) **conglomerata** Brenan, sp. nov. ; *M. usambaricae* Pax et K. Hoffm. affinis, petiolis diu dense ferrugineo-tomentellis sed non longipilosis, stipulis angustioribus, praesertim inflorescentiis ♂ et ♀ ut videtur simplicibus vel subsimplicibus, floribus insigniter glomerato-congestis bracteis foliaceis multo majoribus suffultis valde distincta ; aspectu *M. mauritianam* Boj. ex Baill. (e § *Mauritienis*), cui inflorescentiae similes, revocans, ramulis plerumque tenuioribus, foliis basi haudquaquam peltatis subtus magis venosis, staminibus 3-4 (nec 9-14), ovario saepe biloculari, fructu glandulis flavidis dense induto apice haud rostrato longe distat.

*Arbor* usque ad 18 m. alta, ramulis dense ferrugineo-tomentellis tarde glabris. *Stipulae* lanceolatae, 9-13 mm. longae, basi circiter 3 mm. latae, apice acuminatae, extra more ramulorum tomentellae, caducae. *Folia* coriacea, late ovata vel deltoideo-ovata, 5.5-14.5 cm. longa, 4.5-12 cm. lata, apice acuminata, basi cordata vel subcordata 7-9-nervia et ibi supra saepe sed irregulariter glandulosa, supra juventute densiuscule ferrugineo-puberula mox costa nervisque lateralibus prominulis vel subimpressis exceptis glabra opaca vel vix nitidula venulis arcte intricatis plerumque prominulis, subtus glandulis flavidis sessilibus dense gemmata et secus costam nervos venasque omnes pulchre prominentes ferrugineo-pubescentia et sparse pilosa ; nervi laterales praeter basales utrinque 9-11, inter sese venis subparallelis numerosis conjuncti, prope marginem integrum vel obscure et sparsissime crenulatum arcuato-anastomosantes ; petiolus 1.7-7.5 cm. longus, rotundatus, more ramulorum vestitus. *Inflorescentiae* ♂ et ♀ axillares, plerumque longipedunculatae, 2-13.5 cm. longae (pedunculis 1-9 cm. longis more ramulorum vestitis inclusis), ut videtur simplices vel subsimplices ; bractae ♂ ovato-lanceolatae, acute acuminatae, deflexae, subfoliaceae, 7-20 mm. longae, basi circiter 5 mm. latae et ibi conspicue biglandulosae, ut videtur persistentes ; bractae ♀ ut in mare sed vix deflexae et inferiores nonnunquam lamina foliacea elliptica usque ad 2.5 cm. longa 1.4 cm. lata breviter petiolata praeditae. *Flores* ♂ in glomerulos densos sessiles conferti, glomerulis inferioribus circiter 3-4 mm. latis distinctis, superioribus in capitulum circiter 5-7 mm. longum aggregatis ; calyx extra plus minusve ferrugineo-pubescent, circiter 1 mm. longus, 1.5 mm. latus, in lobos 3 ovatos profunde partitus ; stamina 3-4, filamentis 1-1.5 mm. longis, antheris quadrilocularibus albidis 0.4 mm. longis. *Flores* ♀ ut in mare conferti, glomerulis flores pauciores gerentibus superioribus usque ad 1 cm. latis ; pedicelli brevissimi, circiter 1-2 mm. longi ; calyx extra dense ferrugineo-tomentellus, 3 mm. longus, 2.25-2.5 mm. latus, apice obscure atque

irregulariter tridentatus; ovarium 1-2-loculare, circiter 1.5 mm. longum 1.5-2 mm. crassum, extra glandulis flavidis sessilibus densissime vestitum, apice in stigmata 1-2 crassa cornuta recurva 3-4 mm. longa basi 1.5-1.75 mm. lata supra muriculata subtus ferrugineo-tomentella angustatum. *Fructus* didymi forsan nondum maturi tantum visi, calyce et stigmatibus persistentibus; cocci rotundati, 5-6 mm. alti, 3.5-4.5 mm. crassi, glandulosissimi, aliter laeves; pericarpium lignosum, 0.75 mm. crassum. *Semen* pro cocco unicum, subglobosum, circiter 3.5 mm. diametro, nigrum, haud nitidum, hilo 3 mm. longo pallido.

TANGANYIKA TERRITORY. Tanga Province, Korogwe District: Magamba, Western Usambaras, 1830 m., 27 Apr. 1931, *L. T. Wigg* 541 (♂ fls., typus in Herb. Kew., Herb. Imp. For. Inst., Oxon.):—forest tree: vernacular name (Shambaa) "Kumba" (which "probably includes several species of *Macaranga* as well as *Neoboutonia*"—Wigg). Same locality, altitude, date and vernacular name, *L. T. Wigg* 543 (♀ fls., in Herb. Imp. For. Inst., Oxon.). Shume-Magamba camphor forest, Western Usambaras, Jan. 1935, *C. J. W. Pitt-Schenkel* 443 (frts., in Herb. Imp. For. Inst., Oxon.):—tree, 18 m., subdominant in several communities: vernacular name (Shambaa) "Mkumba".

*M. conglomerata* resembles in its foliage *M. usambarica* Pax et K. Hoffm., with which it shares a broadly ovate, cordate-based lamina. *M. kilimandscharica* Pax has usually more narrowly ovate leaves, often not cordate at base, and mostly with a characteristic glaucous colour on the lower surface, which is lacking in *M. usambarica* and the new species. In its inflorescence *M. conglomerata* is very distinct from all the other African species of the Section *Javanicae*; among the material of *M. conglomerata* available only a single very robust female inflorescence has produced a pair of branches 1.2 cm. long from the lowest node; otherwise the inflorescences, both male and female, all are simple. This, coupled with the large and often very markedly foliaceous bracts, gives our plant a striking but apparently no more than superficial resemblance to *M. mauritiana* Boj. ex Baill., from which it differs in those points mentioned in the diagnosis above.

The new species appears to be restricted to the Shume-Magamba forest reserve in the Western Usambaras, where, however it is probably frequent and doubtless corresponds to what is called *Macaranga kilimandscharica* in Mr. C. J. W. Pitt-Schenkel's paper on the ecology of the Magamba Forest in *Journ. Ecol.* **26**, 50-81 (1938).

## TWO NEW SPECIES OF ISACHNE FROM INDIA.

N. L. BOR.

***Isachne deccanensis*** Bor, sp. nov., *I. himalaicae* Hook. f. comparanda sed laminis foliorum erectis hirsutis facile distinguitur.

*Gramen* perenne ex apice lignosi rhizomatis multis erectis culmis ortis. *Culmi* ad 35 cm. alti, paene ad paniculam vaginis foliisque tecti, laeves, glabri, striatuli, nodis haud barbati. *Foliorum laminae* erectae, planae, lineares, in apicem acuminatum attenuatae, marginibus incrassatae, utrinque marginibusque scabrae vel scaberrimae, utrinque brevibus albis pilis mox deciduis e tuberculis ortis tectae; *foliorum vaginae* laxae,



striatae, brevibus pilis densis e tuberculis ortis caducis tectae, demum scabrae, marginibus longe ciliatae ; *ligulae* ad pilorum seriem redacta.

*Panicula* contracta vel patula, ad 10 cm. longa, ad 4 cm. lata. *Axis* glaber vel hispidus, angulatus, angulis scaber, ramosus ; rami ad 4 cm. longi, capillares, flexuosi, laeves glabrique vel minutissime scabri, ramosi ; pedicelli graciles, apicibus incrassati compressique, saepe macula glandulosa albida mediana instructi, glabri, minutissime scabri. *Spiculae* 1·8–2 mm. longae ; *gluma inferior* 2 mm. longa, dorso plana, marginibus complectentibus, 7–9-nervis, purpurea, marginibus hyalina, apice ciliata, explanata late elliptica, a dorso visa oblonga-apiculata ; *gluma superior* dorso rotundata, explanata paene orbicularis, 11-nervis, marginibus anguste hyalina, apice apiculato ciliata. *Anthoecium inferum* hermaphroditum masculinumve ; *lemma* chartaceum, 1·5 mm. longum, a dorso visum oblongo-obovatum, cremeo-album, sericeo-albis pilis brevissimis tectum ; *palea* ambitu similis, marginibus inflexis ; *antherae* 3, 1·25 mm. longae ; *styli* 2 ; *stigmata* plumosa, purpurea. *Anthoecium superum* hermaphroditum ; *lemma paleaque* eis anthoecii inferioris similes ; *antherae*, *styli*, *stigmataque* similes.

SOUTH INDIA. Nilgiris, Ootacamund Downs, Aug. 1884, *Gamble*, 15290 (typus in Herb. Kew.) ; Pykara, June 1900, *Bourne* ; June 1940, *Barnes*.

**Isachne dimyloides** *Bor*, sp. nov., *I. albenti* Trin. similis sed ab ea flosculis crasse disciformibus haud hemisphericis facile distinguitur.

Gramen annuum. Culmi inferne nodis radicales, serpentes, demum erecti, 20 cm. longi, graciles, invalidi, foliosi usque ad paniculam ; nodi leviter barbati. *Foliorum laminae* usque 4·5 cm. longae, 7 mm. latae, elliptico-acutae, marginibus leviter incrassatae, utrinque glabrae, marginibus minutissime scabrae ; *foliorum vaginae* striatulae, culmos complectentes, marginibus longe ciliatae, glabrae laevesque ; *ligulae* ad seriem pilorum redactae.

*Panicula* 2·5 cm. longa, 1·5 cm. lata, sparse ramosa, pauci-spiculata ; rami crassi, angulati ; pedicelli apice leviter incrassati, sine glandulis. *Spiculae* 1·8–1·9 mm. longae ; *glumae* spiculis aequilongae, marginibus hyalinae, 9–11-nervis, oblongo-apiculatae ab dorso visae, secundum apicem breviter hirtellae. *Anthoecia* paene aequalia, textu similes ; *gluma superior* paullo minor quam inferior. *Anthoecium inferum* hermaphroditum ; *lemma* late-ellipticum vel orbiculare vel elliptico-paullo-obovatum explanatum, textu coriaceum, dorso glabrum, marginibus minutissime pilosum ; *paleae* forma textusque similis, plana, marginibus angustis hyalinis ; *antherae* tres, ·75 mm. longae ; *caryopsis* oblonga, 1 mm. longa. *Anthoecium superum* hermaphroditum ; *lemma paleaque* eis anthoecii inferi similes, sed minores.

INDIA. Sikkim Terai, Dulkajhar, 200 m., 16 Oct. 1884, *C. B. Clarke* 36764 (typus in Herb. Kew.). A remarkable species in which the resemblance of the florets to millstones is expressed in the specific name *dimyloides*, from *δίς* two ; *μύλη* millstone ; *εἶδος* similar.

## ON THE FLORA OF THE NEARER EAST: XXIII.\*

## MISCELLANEOUS NEW SPECIES AND RECORDS.

B. L. BURTT AND P. H. DAVIS.

The following notes include 5 new endemic species from Cyprus, as well as one new subspecies, one variety and 4 new records from this island. The remaining new species and other notes refer to various parts of the eastern Mediterranean and are based largely on P. H. Davis's collections.

Individual responsibility is designated by initials at the end of the appropriate notes. The orchids have been determined by Mr. V. S. Summerhayes (V. S. S.). The types of the new species are in the herbarium of the Royal Botanic Gardens, Kew.

The new Turkish species were collected by P. H. Davis with the assistance of a grant from the Percy Sladen Trust, and his work in determining them has been aided by a Royal Society grant. A general account of the Anatolian journey appears in the Journal of the Royal Horticultural Society for March and April 1949, which also contains descriptions of two new species: *Teucrium sandrasicum* O. Schwarz and *Digitalis davisiana* Heywood. Other new Turkish plants will be published later.

## DELPHINIUM L.

**D. pusillum** Lab. Ic. Pl. Syriae, 4, 5, t. 2 (1812); DC. Syst. Veg. 1, 344 (1818); Huth in Engl. Bot. Jahrb. 20, 382 (1895). *D. pygmaeum* Poir. Encycl. Méth. Suppl. 2, 458 (1812); Dinsmore in Post, Fl. Syr. Pal. & Sinai, ed. 2, 1, 22 (1932).

SYRIAN DESERT. Between Neb'k and Falita, in fallow calcareous field; 1380 m.; flowers pink; June 1943, Davis 6448.

This gathering differs from the type in having its bracteoles not reaching up to the base of the flower. Huth, in his monograph of *Delphinium*, places *D. pusillum* with the allied *D. tomentosum* Aucher in his "tribus" *Longibracteolata* which is characterized by having bracteoles which overtop the base of the flower; in Labillardière's illustration *D. pusillum* is figured as having bracteoles about equalling it. Until further material is available we refrain from giving a name to this form of *D. pusillum* with short bracteoles and would point out that the length of these organs scarcely seems a satisfactory character on which to base subdivisions of the genus. It may be mentioned that there is no essential difference in the shape of the petal of *D. pusillum* and that of *D. tomentosum* Aucher (type).

There is some doubt as to the correct name of this species. *D. pusillum* was published in 1812. The title page of the second volume of the supplement to Poiret's Encyclopédie Méthodique bears the date 1811, but Sherborn and Woodward state (J. Bot., Lond. 44, 319: 1906) that it appeared in 2 parts, the second of these (containing *Delphinium pygmaeum*

\* Continued from K.B. 1940, 266.

Poir.) appearing in 1812. As it is therefore impossible to say which name has priority, the course is here followed of using the name chosen by the author who first united them. De Candolle (Syst. Veg. 1, 344 : 1818) was, it is believed, the first to do so : he used the name *D. pusillum* Lab.

P. H. D.

#### RANUNCULUS L.

**R. chius** DC. var. **leiocarpus** P. H. Davis, var. nov. a typo fructibus laevibus (haud tuberculatis) distinguitur.

CYPRUS. Trypilos (Paphos forest), by damp roadside in the cedar forest ; 1080 m. ; 17 May 1941, *Davis* 3487 (type).

TURKEY. Antalya (Adalia), in graminosis ; 14 Apr. 1860, *Bourgeau* (sub *R. parvifloro* L.) cum forma typica.

P. H. D.

#### PAPAVER L.

**P. postii** Fedde in Bull. Herb. Boiss. 2 sér., 5, 447 (1905) ; in Engler, Pflanzenr. Papaveraceae, 323 (1909).

CYPRUS. Kamlos village on the way to Karavosteri, on rocky metallic soils or roadsides ; 750 m. ; root fleshy thick and long, sepals more or less purple-spotted, petals of an open-brick colour ; 8 May 1937, *Syngressides* 1599. Trypilos (Paphos forest), locally abundant on igneous stony slopes between Kykko and Stavros-tis-Psochas ; 840 m. ; annual with bright orange red flowers ; 17 May 1941, *Davis* 3491.

TURKEY. 6 km. west of Antalya (Adalia) ; 10 m. ; 23 Apr. 1936, *Tengwall* 422.

This species was until recently represented at Kew only by a duplicate of the original collecting from the Nusairy Mountains, Syria. The above records therefore constitute a considerable extension of the specific range. The characteristic tufted habit, to which Fedde drew particular attention, is constant throughout the material examined. Fedde was unable to see flowers of this species and his description may therefore be supplemented as follows (noting, however, that the characters are taken from Cyprus material) :—*Petala* obovata, circiter 1-1.5 cm. longa et 8-10 mm. lata, basi cuneata. *Filamenta* ut videtur purpurea, setacea, antheras flavas 0.75 mm. longas gerentia. *Ovarium* 3 mm. longum, glabrum.

B. L. B.

**P. decaisnei** Hochst. et Steud. ex Boiss. in Ann. Sc. Nat. 2 sér., 16, 372 (1841).

TRANSJORDAN. Edom, Wadi Ram ; 900 m. ; rocky granite slope in *Anabasis articulata*-*Noaea mucronata* association ; 15 Apr. 1945, *Davis* 9035. Ibid., granite slope in *Anabasis articulata* association ; 15 Apr. 1945, *Davis* 9094.

This is apparently a new record for Transjordan.

P. H. D.



## HYPECOUM DC.

**H. deuteroparviflorum** Fedde in Engler, Pflanzenr. Papaveraceae, 90 (1909).

EGYPT. Gebel Asfar (near Bir Gindali between Cairo and Suez) ; on hill of flint gravel, only 1 plant found ; flowers yellowish ; 8 Apr. 1945, *Davis* 10319.

It is a littoral species in Egypt and has not previously been recorded for the eastern desert, the area " D.a. sept." of Muschler's Flora of Egypt.

P. H. D.

**H. procumbens** L. Sp. Pl. 124 (1753).

CYPRUS. Agios Philon, near Rizokarpaso ; sand-dunes ; annual with glaucous leaves and bright yellow flowers ; 19 Feb. 1941, *Davis* 2208.

Not previously recorded from the island.

P. H. D.

## ALYSSUM L.

Extensive studies on *Alyssum* sect. *Odontarrhena* have been carried out in recent years by E. J. Nyárády (see Bul. Grâd. Bot. Cluj, 7, 8, 9, 18 : 1927-1938).

Unfortunately this author did not have access to all the species described by Boissier (Fl. Or. 1 : 1867) ; indeed, so many of these figure in the list of species unknown to him that it is very difficult to correlate the two accounts. Confusion is made worse by the fact that some of the material described by Nyárády had already been published under the generic name *Odontarrhena* by Jordan and Fourreau (Brev. Pl. Nov. 2 : 1868).

The following notes chiefly concern the Cyprian representatives of the section, but a few of the more straightforward points concerning the mainland forms have been included.

**A. condensatum** Boiss. et Hausskn. in Boiss. Fl. Or. 1, 268 (1867). *A. serpyllifolium* Desf. forma, sec. Boiss. in Ann. Sc. Nat. 2 sér. 17, 151 (1842).

S.E. TURKEY. Ak Dagħ\*, *Aucher-Eloy* 266 (lectotype). Akher Dagħ ; 1800 m. ; July 1907, *Haradjian* 1592. Jehan Keupri, between Marash and Zeytun ; 750 m. ; acid sandstone rock ; flowers small, bright yellow in loose heads  $\frac{1}{2}$ "-1' in diameter, leaves grey ; 9 May 1934, *Balls* 1003.

This species is characterised by its obtuse oblong capsules and in this respect differs from the Cyprian material hitherto referred to it. The plant from Cyprus has elliptic acute capsules and is identified below as *A. cypricum* Nyárády. Three other species accepted by Nyárády are very closely allied to *A. condensatum*. These are *A. anatolicum* Hausskn. ex Nyárády, *A. filiforme* Nyárády and *A. venustum* Nyárády. It should be

\*Of the many mountains so named this is probably the one lying north of Gaziantep, which the account of Aucher-Eloy's travels shows he visited.

noted however that the earliest specific name amongst these three is provided by *Odontarrhena lycia* Jord. et Fourr. (Brev. Pl. Nov. 2, 3 : 1868) ; this was based on Bourgeau, *Plantae Lyciae* no. 28 (in lacunosis subalpinis montis Elmalu), the same collecting which was named *A. venustum* var. *nebrodensiforme* by Nyárády. For the present I propose to leave the question of the specific limits of these plants in abeyance, and I am not transferring *Odontarrhena lycia* to *Alyssum* until its existence as a species distinct from *A. condensatum* can be more satisfactorily demonstrated.

**A. cypricum** Nyárády in Bul. Grâd. Bot. Cluj, 7, 156 (1927). "*A. condensatum* Boiss. et Hausskn." sec. Boiss. Fl. Or. Suppl. 49 (1888) ; Holmboe, Stud. Veg. Cyprus, 89 (1914) ; Lindberg, Iter Cyprium, 17 (1946)—non Boiss. et Hausskn. *A. virgatum* Nyárády var. *mutabile* Nyárády, op. cit. 116.

CYPRUS. Common on Mt. Troödos from 900–1920 m., the following herbarium numbers may be cited :—*Sintenis & Rigo* 843 ; *Kotschy* 703 ; *Ussher* 26 ; *Tracey* 22 ; *Syngrossides* 752 ; *Chapman* 60 ; *Davis* 1784, 1867, 3156, 3207 ; *Kennedy* 487, 488, 489, 490, 491, 492, 496.

*Kotschy* 703 is the type number of *A. virgatum* var. *mutabile* Nyárády ; it is however nothing more than a shade form of *A. cypricum*. In the copious material of this group from the Troodos area which is now available for study, there is no suggestion of any other species occurring beyond *A. cypricum* and *A. troodi*. The type specimen of *A. cypricum* was collected by E. Deschamps in 1893 and is now in Freyn's herbarium at Brno. I have not examined it, but Nyárády's description and figures leave no doubt as to its identity.

**A. akamasicum** B. L. Burt, sp. nov. inter species humiliores sectionis *Odontarrhenae* (C. A. Mey.) Koch ramis procumbentibus, indumento et caulium et foliorum et fructuum e pilis stellatis appressis subsquamiformibus composito insignis et nulli arcte accedens.

*Herba* perennis, suffruticosa, e basi ramosa ; rami alii breves erecti 10 cm. usque alti, alii procumbentes 8–15 cm. vel ultra longi, omnes pilis albis stellatis multiradiatis valdissime appressis subsquamati. *Folia* obovata, circiter 1 cm. longa et 0.5 cm. lata, basi attenuata, apice obtusa, margine integerrima, plana, supra dense subtus densissime uti rami stellato-subsquamata. *Racemi* simplices vel ramis 2–3 angulo subrecto patentibus basi praediti ; axis florifer brevis circiter 5 mm. longus, flores congesti circiter 15 gerens. *Pedicelli* floriferi circiter 2 mm. longi ; fructiferi 5 mm. usque. *Sepala* 2.25 mm. longa, vix 1 mm. lata, oblonga, obtusa, navicularia, extra dense stellato-pilosa. *Petala* 3.25 mm. longa, 1.25 mm. lata, spatulata, apice leviter retusa, nervo medio utrinsecus 1 vel 2 laterales gerente percursa, glabra, lutea. *Filamenta longa* 2 mm., appendice tertiam partem aequante et ad medium filamentum cohaerente. *Filamenta brevia* 1.5 mm. longa, appendice medium filamentum aequante sed ad basin usque libera. *Antherae* vix 0.5 mm. longae. *Ovarium* obovato-suborbiculare, valdissime compressum, 1.5 mm. altum, 1.25 mm. latum, dense stellato-subsquamatum. *Stylus* 1 mm. longus, glaber. *Ovula* 2–3. *Fructus* 4.5 mm. longus, 4 mm. latus.

## PLATE 3.

*Alyssum akamasicum* B. L. Burtt



PLATE 4.



P.H. Davis 3083

*Alyssum chondrogynum* S. & A. Small, n.s.

Cape Verde, above Yersa (high limestone)

at 2000 ft

Abundant in sparse limestone forest on  
slopes (mostly in?) at Yersa above Yersa  
grows among gorges in open places among the  
trees.  
4: similar in habit to *A. tricolor*, but roots holding  
the soil more firmly & growth more lax and woody.  
Caulis luteus. *Malva glabra* 10/4/1941

*Alyssum chondrogynum* B. L. Burtt

CYPRUS. Akamas peninsula ; common throughout the forest area growing in igneous scree—usually serpentine—and in the pine forest (*Pinus brutia*), where the growth is more straggly than when growing in the open ; stem usually procumbent, flowers bright yellow ; in association with *Thymus integer*, *Aegialophila cretica*, *Centaurea veneris* and *Carlina pygmaea* ; 3 May 1941, *Davis* 3308 (type). Akamas forest ; 300 m. ; minute white [sic] flower confined to diallagitic rocks ; April 1937, *Chapman* 284.

**A. chondrogynum** *B. L. Burt*, sp. nov. in sectione *Odontarrhena* (C. A. Mey.) Koch ovario tuberculato-papilloso insignis. Ceterum ad *A. elatum* Boiss. accedens sed illa species inflorescentia elatiore, pedicellis gracilioribus, ovario omnino glabro, inter alia distinguitur.

*Herba* suffruticosa, perennis, e basi ramosa ; rami erecti vel ascendentes, 20-30 cm. alti, pilis albis stellatis multiradiatis valdissime appressis subsquamati. *Folia* orbiculari-obovata, circiter 10 mm. longa et 8 mm. lata, basi subito attenuata, apice apiculo recurvo emarginata, margine integerrima, secundum costam plicata, supra dense subtus densissime uti rami stellato-subsquamata. *Racemi* terminales et ex axillis foliorum supremorum laterales, corymbum terminalem formantes. *Flores* dense congesti, post anthesin distantiores. *Pedicelli* floriferi circiter 2.5 mm. longi, ascendentes ; fructiferi 5 mm. usque, recte patentes. *Sepala* 2.5 mm. longa, 1.25 mm. lata, oblonga, obtusa, navicularia, extra dense stellato-pilosa. *Petala* 3.25 mm. longa, 0.75 mm. lata, obtuse oblanceolata, apice rotundata, nervo medio utrinsecus lateralem unum gerente percursa, glabra, lutea. *Filamenta longa* 2.5 mm. longa, appendice subaequilongo ad medium filamentum usque cohaerente. *Filamenta brevia* 2 mm. longa, appendice fere 2.5 mm. longa ad basin usque libera. *Antherae* 1 mm. longae. *Ovarium* obovato-suborbiculare, valdissime compressum, 1.5 mm. longum, 1.25 mm. latum, tuberculato-papillosum. *Stylus* 1 mm. longus, glaber. *Ovula* 2. *Fructus* primum tuberculato-papillosum, demum glabrescens, obovato-suborbicularis, 4 mm. longus et 4 mm. latus, basi abrupte angustatus, apice leviter emarginato, stylo persistente. *Semina* exalata.

CYPRUS. Limassol district, above Yerása ; 600 m. ; abundant in sparse *Pinus brutia* forest on igneous (serpentine ?) hillsides, growing among garigue in open places among the pines ; perennial ; similar in habit to *A. troodi* but the roots holding the soil more firmly and growth more lax and uneven ; flowers yellow ; 10 Apr. 1941, *Davis & Kennedy* (*Davis* 3083 : type).

**A. rhodopense** *Formanek* in Deutsch. Bot. Monatschr. **16**, 20 (1898) subsp. **armeniacum** *Nyárády* in Bul. Grád. Bot. Cluj. **8**, 156 (1928).

*Nyárády* quotes under this subspecies Bourgeau *Pl. Armen.* 1862, no. 38. This number is, however, the type of *Odontarrhena bourgaei* Jord. & Fourr. (Brev. Pl. Nov. **2**, 4 : 1868). If the Armenian plant is really conspecific with *Formanek's A. rhodopense*, then the epithet proposed by Jordan and Fourreau has priority and must be taken up in *Alyssum*. I have not seen any material of the Armenian plant, however, and therefore refrain from taking any definite action pending an opportunity of its full investigation.

**A. rubricaulis** (Jord. et Fourr.) B. L. Burtl, comb. nov. *Odontarrhena rubricaulis* Jord. et Fourr. Brev. Pl. Nov. 2, 6 (1868).

TURKEY. Prov. Antalya (Lycia) : in lacunosus, Elmalu ; 17 May 1860 ; *Bourgeau*, Plantae Lyciae no. 25 (type). Armenia : Gumusch-kane, Islavros ; 9 Aug. 1889 ; *Sintenis* 1683. Prov. Ankara (Galatia) : Beynam ; ledge of limestone rock in *Quercus macchie* ; 5 July 1947, *Davis* 13026.

This appears to be a good species. It is characterised by almost orbicular pods with sparse appressed stellate hairs and reddish stems with a similar indumentum. It is not mentioned by Nyárády.

**A. troodi** Boiss. Fl. Or. Suppl. 49 (1888) ; Holmboe, Stud. Veg. Cyprus, 89 (1914) ; Schulz in Fedde, Rep. Sp. Nov. 33, 183 (1933) ; Lindberg, Iter Cyprium, 17 (1946). *A. coriaceum* Nyárády in Bul. Gräd. Bot. Cluj, 9, 46 (1929), e descriptione.

CYPRUS. Common on Mt. Troödos from 1500–1920 m. ; the following herbarium numbers may be cited :—*Sintenis* & *Rigo* 844, *Chapman* 79, *Ussher* 49, *Wyatt* 19, *Syngrassides* 730, *Kennedy* 493, 494, 495, *Davis* 1783, 1805.

The type specimen of *A. coriaceum* Nyárády is *Kotschy* 771, which I have not seen. Nyárády was unacquainted with *A. troodi* except from Boissier's brief description. Comparing the copious material of *A. troodi* now available at Kew with Nyárády's description of *A. coriaceum*, there can be no doubt that they are conspecific.

B. L. B.

#### HYPERICUM L.

**H. perfoliatum** L. Syst. ed. 12, 510 (1767) ; Stefanoff in Jahrb. Land. Forst-wiss. Fak. Univ. Sofia, 11, 32 (1933) ; Rechinger, Fl. Aegaea, 264 (1943). *H. ciliatum* Lam. Encycl. Méth. 4, 170 (1796) ; Desf. Choix Pl. t. 53 (1808).

CYPRUS. Stavros-tis-Psochas, Paphos forest ; in woods ; perennial 1½ ft. high, leaves irregularly perforated ; 3 July 1940 ; *Davis* 1765.

This is apparently a new record for Cyprus. The specimen has been compared with the type in the Linnean herbarium ; it also agrees well with Desfontaines' illustration of Tournefort's Cretan plant which was described as *H. ciliatum* by Lamarck. *H. perfoliatum* has been recorded by Stefanoff for Central Spain and France, Italy, Istria, Dalmatia, Albania, Greece, Crete, Asia Minor (Lydia, Pamphylia), N. Africa and Madeira.

B. L. B.

#### GALIUM L.

**G. exstipulatum** P. H. Davis, sp. nov. *G. sinaico* (Decaisne) Boiss. affinis, sed foliis ellipticis et ovario floccoso differt.

*Planta* perennis, saxatilis, e basi suffrutescente pluricaulis. *Caules* decumbentes, tenues, 7–15 cm. longi, ad 1 mm. crassi, quadrangulares, scabri, internodiis 0.5–2.5 cm. longis. *Folia* opposita, bina, exstipulata, elliptica, 3–10 mm. longa, 1.5–4 mm. lata, subsessilia, plana, ±



mucronata, subtus prominenter uninervia ; folia floralia cymis breviora. *Cymae* aliquantum confertae, pauciflorae, in axillis longe pedunculatae, pedicellis capillaribus floribus brevioribus vel aequilongis. *Corolla* rotata, lutescens, laciniis oblongo-ovatis 1 mm. vel paulo ultra longis trinerviis extus sub lente scabriusculis in mucronem incurvum tenuiter abeuntibus. *Antherae* ovatae, 0.5 mm. longae. *Ovarium* pilis hamatis breviter albo-floccosum. *Fructus* ignotus.

TRANSJORDAN. Edom : Wadi Ram ; ca. 1000 m. ; in shady rocks of Nubian sandstone near the fort of the Arab Legion ; 15 Apr. 1945, *Davis* 9038 (type).

In its exstipulate leaves the new species approaches *G. sinaicum* (Decaisne) Boiss., from which it may be distinguished by its differently shaped foliage and floccose ovary ; it differs further in its more lax habit, generally longer peduncles and larger anthers. Whereas *G. sinaicum* is endemic to the rocks of southern Sinai, *G. exstipulatum* occurs in the Saharo-Sindian territory of Edom near the Arabian frontier. Both species are apparently reduced types, and owe their survival to their specialised habitats.

P. H. D.

#### CARLINA L.

**C. barnebianae** *Burt et Davis*, sp. nov. ex affinitate *C. lanatae* L. et *C. pygmae* (Post) Holmboe, ab illa habitu perenni, caule minus lanato, foliis angustioribus lineari-oblongeolatis (nec ovatis) segmentis lateralibus basi latioribus canaliculatis marginibus spinulosis in spinam desinentibus ; ab hac foliis subglabris summis capitula valde superantibus profunde pinnatisectis ad basin angustatis differt.

*Herba* nana, basi lignosa, ramosa, 8 cm. usque alta, perennis. *Caules* densiuscule foliati, tenuiter araneosi. *Folia* pinnatisecta, ambitu leviter oblanceolata, inferiora circiter 8–9 cm. longa et 2 cm. lata (segmentis basi 5 mm. latis inclusis), superiora paulo breviora et latiora segmentis basi angustioribus ; superiora inferioribus duriora magis pungentibus segmentis canaliculato-plicatis saepe basi margine distali segmenti spina decurva praeditis ; folia omnia marginibus spinoso-denticulata, utrinque primum leviter araneosa, glabrescentia ; folia summa capitulum superantia. *Capitula* terminalia, solitaria, supra folia sessilia, circiter 2 cm. longa et 1.5–2 cm. lata, extra araneosa. *Involucri bracteae* extimae elliptico-lanceolatae, 6 mm. longae, apice pungente acuminatae, per totam longitudinem capitulo appressae ; mediae sensim elongatae ; intimae apice conspicuo rubro-nitente 7 mm. longo praeditae. *Receptaculi paleae* albae, nitentes, in segmentis setiformibus ultra mediam fissae. *Flores* omnes hermaphroditi, corollis tubulosis 8 mm. longis apice 5-lobatis (lobis 2 mm. longis). *Antherae* 5 mm. longae, basi caudis ciliatis praeditae. *Stylus* 8 mm. longus apice biramosus, infra ramis annulo crasso pilifero praedito, rami breves, obtusi. *Pappi setae* circiter 50, pulchre plumosae, 8 mm. longae, basi leviter coalitae. *Achaenia* immatura cylindracea, 3 mm. longa, pilis appressis fulvo-sericeis oblecta et eis apicem superantibus pseudo-coronata.

E. CRETE. In schistosis maritimis inter claustrum Toplou et Siteia, copiose ; 19 Sept. 1938, *Barneby & Davis*, 1991 (type).

*C. barnebiana* is allied to the Cyprian *C. pygmaea* (Post) Holmboe with which it agrees in dwarf stature and perennial habit and to which it forms a parallel insular endemic. It is also related to *C. lanata* L., an annual species widespread in the Mediterranean and found both on Cyprus and on Crete.

B. L. B. & P. H. D.

**C. corymbosa** L. subsp. **graeca** (Heldr. et Sart.) Rech. fil.  $\times$  **C. pygmaea** (Post) Holmboe.

*Planta* perennis inter parentes  $\pm$  intermedia, variabilis. A *C. corymbosa* subsp. *graeca* statura nana (4–12 cm. alta), capitulis minoribus, phyllis externis brevioribus, radiis flavis plerumque extra macula purpurea notatis differt. A *C. pygmaea* foliis plerumque minus lanatis, phyllis externis acutioribus et saepe radios dissimiliter coloratos aequantibus recedit.

CYPRUS. Kythrea, occurring sporadically among the parents on arid hills of shale and sandstone; 22 Sept. 1940, Davis 1961. Ibid., 16 Sept. 1940, Davis 1954.

The specimens of this new hybrid were found scattered over a fairly large area round Kythrea, and show a wide range of characters intermediate between the parents. It should be noted here that *C. pygmaea* has a perennial fusiform root, a character which further distinguishes this attractive Cyprian endemic from *C. lanata* L. One plant of a white-flowered form of *C. pygmaea* (Davis 1959) was collected at Kythrea, though it retains the purple spot on the reverse of the *radii* characteristic of the type.

In the igneous Central range and Akamas peninsula of Cyprus forms of *C. pygmaea* were collected which differ somewhat from those of the Kythrean sandstones of the Northern range. The leaves tend to be more ample, are often purplish, and have a more sparse indumentum; the outer involucral bracts tend to be broader. As it is possible that these characters are modifications—the igneous form occurs in woods of *Pinus brutia*—this form does not seem to warrant, in the absence of experimental data, taxonomic status. Gatherings of it may be seen in the Kew Herbarium.

In cultivation at Kew plants of *C. pygmaea* raised from seeds gathered at Kythrea have retained their perennial habit but grow considerably taller than in Cyprus.

P. H. D.

#### CENTAUREA L.

**C. veneris** Burtt et Davis, sp. nov. in sectione *Acrolopho* (Cass.) Boiss. ponenda. A *C. cuneifolia* Sibth. et Sm. sens. lat. (Hayek, Prodr. Fl. Pen. Balc. 2, 763: 1931) caulibus e rhizomate valde perenni numerosis prostratis, segmentis foliorum basalium semper simplicibus, capitulis secundis vix paniculatis, pappo longitudine dimidium achenii paulo excedente inter alia recedit.

*Planta* perennis, caulibus e rhizomate lignoso  $\pm$  numerosis 10–30 cm. longis gracilibus prostratis. *Folia* basalia albo-tomentosa, pinnatifida, ad 5 cm. longa, segmentis simplicibus vel integris vel subdentatis, terminali

PLATE 5.



*Centaurea veneris* Burt et Davis



PLATE 6.



HERB. HORT. BOT. REG. KEW.

*Lactuca tetrantha* Burtt & Davis

Cyprus, Nicosia District  
20.10.1938

E.W. Kennedy 1531

*Lactuca tetrantha* Burtt et Davis

suborbiculari quam lateralibus obovatis saepe majore; folia caulina griseo-lanata, inferiora simplicia vel subpinnatifida, superiora omnia simplicia obovata integra, 1-1.5 cm. longa et 3-5 mm. lata, basi attenuata. *Capitula* pedunculata, ob caules prostrati secunda, unica, raro pauca in ramis brevibus ex axillis foliorum caulinum superiorum orientibus disposita, ovato-cylindrica, 8-12 mm. longa (floribus exclusis). *Involucra bracteae* appressae; exteriores ovatae, acutae c. 5 mm. longae, pallidae, superne arachnoideae, nervis haud prominentibus  $\pm$  7-ciliato-pectinatae, mucrone terminali quam ciliis lateralibus albidis vix 1 mm. longis haud longiore; interiores longiores (10 mm. attinentes), lineares, in appendicem subintegrum abeuntes. *Receptaculum* paleis 1.5 cm. longis dense setiferum. *Flores* roseo-lilacini, c. 20, involucri vix duplo longiores, marginales 7 radiantes, neutri; interiores hermaphroditi, corollis c. 13 mm. longis ad 4 mm. 5-fidis, filamentis dense tuberculato-pilosis, antheris 5.5 mm. longis (appendice sterili 2 mm. longo incluso), stylo 11 mm. longo ramis brevibus obtusis. *Pappus* e setis rigidis supra albidis infra purpurascens externis 2 mm. longis quam internis saltem duplo longioribus compositus. *Achaenia* obovato-elliptica, nitida, fusca (immatura olivacea), hilo supra basin laterali, 3 mm. longa et 1.5 mm. lata.

CYPRUS. Akamas forest: April 1937, *Chapman* 283. Akamas peninsula; locally abundant within the pine forest area, but found only on serpentine, growing in scree and rocky places with *Thymus integer*, *Carlina pygmaea* and *Alyssum* sp. [*A. akamasicum* B. L. Burtt—see p. 100]; 3 May 1941, *Davis* 3315 (type).

This rare and attractive species is apparently entirely confined to serpentine outcrops of the Akamas peninsula, avoiding not only the limestone but also adjacent igneous rocks other than serpentine. Its prostrate habit and undivided upper leaves render it very distinct from the erect *C. cuneifolia* S. & S. which has all its leaves pinnatisect. *C. veneris* is, in fact, an isolated species without any very close affinity.

B. L. B. & P. H. D.

#### LACTUCA L.

**L. tetrantha** Burtt et Davis sp. nov., *L. vimineae* (L.) Presl valde affinis sed habitu perenni, statura humili, caulibus collo lanigeris, in parte superiore subcorymbosis, foliorum basalium lobo terminali ovato-triangulari, foliis caulinis minus decurrentibus, capitulis semper quadrifloris, ligulis luteis extra cupreis divergit.

*Radix* perennis, ramosus. *Caules* 1-3, erecti, pallidi, glabri, 7-12 cm. alti (solum in umbrosis altiores) inferne haud ramosi, superne in inflorescentiam subcorymbosam abeuntes. *Folia* (axillis lanigeris exclusis) glabra, purpurea: basalia tandem marcescentia, plerumque 2.5-6 cm. longa, lyrata, runcinato-pinnatifida,  $\pm$  5-lobata, lobo terminali ovato-triangulari quam lobis lateralibus triangularibus  $\pm$  reflexis multo majore, lano in axillis petiolorum attenuatorum valde conspicuo; caulina parva, lanceolata, aliquantum breviter auriculato-decurrentia, superiora integra (summa minutissima), inferiora, in axillis lanigera, saepe paucilobata. *Capitula* omnia quadriflora. *Involucrum* cylindricum, ad 1.8 mm. longum, purpurascens, phyllis paucis infimis ovatis internis

linearibus. Flores 17 mm. longi : tubus 8 mm. longus, superne paulo inflatus pilosulus, inferne glaber, ligula 9 mm. longa, fere 4 mm. lata, lutea, extra cuprea, 6-nervata, apice abrupte truncata breviter 5-dentata, in dentes triangulares 0.5 mm. longos fissa ; antherae 5 mm. longae ; stylus 15 mm. longus, in parte superiore pilis ascendentibus pilosulus, apice biramosus, ramis fere 1.5 mm. longis recurvis obtusis. *Achaenia* (cum rostro) 10–12.5 mm. longa, inferne anguste elliptica 5–6 mm. longa, 1 mm. lata, nigra, 10–12 costata, transverse minutissime rugulosa, superne in rostrum aequilongum nigrum disco pallido terminatum sensim attenuata. *Pappus* 6 mm. longus, niveo-bombycinus ; setae sub lente barbellatae, conformes.

CYPRUS. Chionistra, due south ; 1620 m. ; in rock on the bare mountainside ; 20 Aug. 1937, *Kennedy* 997. Kryos Potamos ; 1650 m. ; in rock on the mountainside above the stream ; flowers golden yellow before drying ; 4 Sept. 1937, *Kennedy* 998. Chionistra ; 1890 m. ; in rock on the steep northern slope ; 10 Aug. 1937, *Kennedy* 1008. Kryos Potamos ; 1770 m. ; cracks of rock by the wintertime source of the river, now dry ; rocks joining ; 1 July 1939, *Kennedy* 1480, 1481. Kryos Potamos ; 1620 m., cracks of rock 50 ft. above the river ; 10 July 1938, *Kennedy* 1482. Chionistra, north-east ; 1800 m. ; cracks of rock in a rain gully ; 12 July 1938, *Kennedy* 1483. Kryos Potamos ; 1770 m. ; bare rock above the highest source of the river ; petals red outside ; 17 July 1938, *Kennedy* 1520. Kryos Potamos ; 1710 m. ; rock beside the dry river-bed, petals red outside ; 20 July 1938, *Kennedy* 1521. Kryos Potamos, 1680 m. ; bare rock ; flowers reddish ; the most frequent form above 1500 m., many patches of few plants ; 19 Aug. 1938, *Kennedy* 1525. Pass of Troödos, eastward ; 1650 m. ; rock under pine trees ; 26 Sept. 1938, *Kennedy* 1527. Kryos Potamos, 1695 m. ; beneath cool shady rocks on gentle slope to the river bed ; flowers reddish gold ; the usual form in small colonies ; 30 Oct. 1938, *Kennedy* 1531. Chionistra, 1800 m. ; under shrubs ; flowers golden purple yellow ; 6 Oct. 1937, *Syngrassides* 1688. Chionistra ; 1650–1860 ; serpentine screes and in open woods of black pine ; perennial ; capitula 4-flowered, ligules yellow with coppery reverse ; 19 Oct. 1940, *Davis* 1941 (type).

*L. tetrantha*, which is endemic to the high serpentine area of Chionistra (Troödos), can be distinguished at a glance from *L. viminea* (L.) Presl which also occurs there sporadically in a dwarfed but otherwise typical form. The new species can be recognized by the following features ; its perennial habit ; more or less corymbose inflorescence borne on stems unbranched below ; the woolly collar ; the comparatively large terminal lobe of the often purplish basal leaves ; the shortly decurrent cauline leaves ; the constantly four-flowered capitula with their characteristically coloured ligules (bright yellow with a coppery reverse). Although the achene of the new species is indistinguishable from that of *L. viminea* (L.) Presl, we consider the ensemble of other distinguishing characters justifies specific status. Alpine forms of *L. viminea* (L.) Presl have been seen, both in the herbarium and the field, from Morocco, Spain and the Antilebanon, but apparently do not differ from the typical form of that species in anything but their dwarf stature.



In comparison with *L. tetrantha*, it is interesting to note that *L. alpestris* (Gandoger) Rech. fil., with achenes distinct from those of *L. viminea* (L.) Presl, is confined to the high limestone mountains of Crete

B. L. B. & P. H. D.

#### STAEHELINA L.

***S. lobelii*** DC. in Ann. Mus. Paris, **16**, 194 (1810). *S. apiculata* Labill. Ic. Pl. Syr. **4**, 3, t. 1 (1812).

**CYPRUS.** Yaila, Northern range ; 750 m. ; very rare, found only in crevices in large limestone rocks facing west, between Halefka forest station and the summit cliff of Yaila, growing with *Umbilicus cyprius* ; forms a saxatile congested shrub up to 4 ft. across, with trunks like those of *S. fruticosa* ; flowering stems herbaceous, leaves bright green, viscid when young ; not more than 50 plants seen ; 27 Mar. 1941, *Davis* 2834.

This woody Composite has hitherto only been known from cliffs of Lebanon and Southern Anatolia. The species belongs to a small Mediterranean genus of dwarf, late-flowering shrubs ; of the six species four occur in the Eastern Mediterranean ; these are so distinct from one another that the great antiquity of the group cannot be doubted. The woodiest species in the genus, *S. arborescens* L., is endemic to the shady limestone precipices of Crete, where it occupies the northern side of the island, being replaced by *S. fruticosa* L. (which also occurs in a few small islands in the Dodecanese and *S. Cyclades*) on the vertical cliffs of the southern part. These two plants are so utterly unlike each other that one can hardly be considered as derived from the other ; they are evidently relict types, and their degree of affinity is not comparable to that of several other twin species in Crete [such as *Chionodoxa cretica* Boiss. and *C. nana* (Roem. & Schult.) Boiss., *Helichrysum siculum* (Spreng.) Boiss. and *H. heldreichii* Boiss., *Bellis longifolia* Boiss. et Heldr. and *B. silvestris* Cyr., *Hypericum empetrifolium* Willd. and *H. amblycalyx* Coult. & Gandoger.] in which the relationship is very close. It is to one of these Aegean *Staeheleinæ* — *S. fruticosa* L. — that *S. lobelii* DC. is probably most closely related. In this connection it seems worth noting that the white flowers of both species smell strongly of Cherry Pie (*Heliotropium*). The fourth eastern species is *S. uniflosculosa* Sibth. & Sm. which has a fairly wide distribution in the Balkan peninsula, though not reaching the *Cyclades* or Crete ; it is not a cliff plant, but grows in open rocky woods. In the Western Mediterranean *S. dubia* L. occurs on open calcareous hillsides from Italy to Portugal and Morocco. *S. baetica* DC., a rare plant from Southern Spain (Estepona), is stated to grow in rocky and gravelly places, and is certainly very closely related to the widespread *S. dubia* L. In this calciphilous genus, as in many others, the saxatile habit is directly correlated with the rarity of the species and the development of woody stems. There is no doubt that the saxatile way of life is vital to the survival of such relicts. It reduces competition with larger life-forms, eliminates the effects of grazing and provides shade. Some Mediterranean plants exhibit a not very extreme saxicolous habit which is developed only at the edge of their range (as with *Hypericum lanuginosum* Lam. in Palestine) ; in such cases this habit is not a characteristic of the species as a whole, but is locally acquired in response to unfavourable

conditions. In the case of *Staehelina lobelii* DC., *S. fruticosa* L. and *S. arborescens* L., however, the absolute fixity of an extreme chasmophytic habit in such widely different species suggests that this manner of living has been established for a very long time and may even have characterised an ancestral stock.

P. H. D.

#### ASYNEUMA GRISEB.

**A. pulvinatum** P. H. Davis sp. nov. valde insignis, dense pulvinaris, foliis minutis rosulatis et inflorescentiis racemosis brevissimis saepe ad floram unicam reductis, valvulis in mediam capsulam sitis distinguitur.

*Planta* perennis, dense pulvinaris, saxatilis, ramis numerosis pseudo-dichotomis dense foliatis hemisphaeram ad 25 cm. diam. formantibus. *Folia* minuta, ad 8 mm. longa et 1.5 (1.75) mm. lata, lineari-elliptica, acuta, integra, basi paulo dilatata, sessilia, glaucescentia, margine ciliato excluso glabra, superne rosulata, inferne in senectute basibus pallidis solum persistentibus imbricata columnas formantia. *Inflorescentiae* 2–15 (20) mm. altae, simplices rigidae, pubescentes, foliis paucis vel nullis ut bracteis oblongo-lanceolatis minutissimis; flores in racemum brevissimum 1–7-florum dispositi. *Pedicelli* 1–2 mm. longi, in axillis bractearum singuli, bracteolis lineari-lanceolatis minutissimis muniti. *Calyx* breviter pilosus, receptaculo late pyriformi 1–1.5 mm. longo, laciniis 2–3 mm. longis lanceolatis integris. *Corolla* pallide lilacino-caerulea fere ad basin in laciniis lanceolato-linearibus acutis 6 mm. longis 1.5 mm. latis glabrescentibus patentibus fissa. *Stamina* 5 mm. longa; anthera oblonga, 3.5 mm. longa; filamenta dilatata, ciliata, 1.5 mm. longa. *Stylus* exsertus, 8 mm. longus, superne pilosulus, ad  $\frac{1}{4}$  in ramos deinde recurvos trifidus. *Capsula* late ovata, 3 mm. longa, 2.5 mm. lata, versus mediam valvulis 3 praedita.

TURKEY. Prov. Antalya (Lycia): Tahtali Dağ (above Kemer) in rocks on N. ridge at the upper limit of the *Cedrus libani* ssp. *stenocoma*—*Carpinus orientalis* zone, 1900–2000 m., 16 Aug., 1947, Davis 14163. Tahtali Dağ, in cliffs below Çukur yayla, about 1500 m., flowers lavender blue, leaves glaucescent, 17 Aug. 1947, Davis 14149 (type).

This beautiful dwarf species cannot be satisfactorily related to any other, though the median position of the capsular valves suggests a possible affinity with the perennial *A. psilostachys* (Boiss.) Bornm. or *A. amplexicaule* (Willd.) Handel-Mazzetti. Its dense cushion habit, however, and minute distinctively shaped leaves arranged in numerous rosettes, are unique. It holds an isolated position in its genus that parallels that of *Diosphaera asperuloides* (Orph. et Boiss.) Buser in its own, and there can be no doubt of its relict nature. *A. pulvinatum* P. H. Davis occurs in the hard limestone cliffs of Tahtali Dağ in Lycia—a hitherto unbotanised mountain that has produced several new species of remarkable distinctness. It grows in crevices of either vertical or sloping rock, and is locally the dominant chasmophyte, forming hard mounds up to 25 cm. across and flowering most freely in the sun. The forked stems composing the hummock are covered with the imbricated leaf-bases of previous years' rosettes. By counting these the age of a tightly grown plant 15 cm. in diameter is estimated at not less than 40 years. During 3–4 (5) years the

stems grow 1 cm. in length. The simple racemose inflorescences (with very short pedicels) rise singly from the rosettes of the current year ; they are rarely more than 15 mm. tall, being generally much shorter and often reduced to a single nearly sessile flower of light lavender-blue. In cultivation it retains its pulvinate habit. A new combination is required for another species of this genus from Asia Minor.

**Asyneuma floribundum** (Stapf) P. H. Davis comb. nov. *Podanthum floribundum* Stapf in Bot. Mag. t. 8936 (1922).

P. H. D.

#### MICROMERIA L.

**M. carica** P. H. Davis sp. nov. (Sect. *Pseudomelissa* Benth.) a *M. taygetea* P. H. Davis habitu elatiore, indumento sparso, cymis laxis quam foliis floralibus longioribus, calyce graciliore dentibus subaequalibus acuminatis, nuculis subapiculatis valde discrepat.

*Caules* basi indurati, numerosi, ascendentes, simplices vel inferne subramosi, gracillimi, 15-30 cm. alti, vix 1 mm. lati, sparse et breviter pubescentes, internodiis ad 3 cm. longis. *Folia* late ovata, brevipetiolata, integra, subapiculata vel saepe acutiuscula, ad 1 cm. longa (vel paulo longiora) et 6 mm. lata,  $\pm$  velutina, virescentia, textura tenui, nervis lateralibus haud prominentibus. *Folia floralia* inferiora caulinis simillima, superiore ovato-elliptica sensim diminuentia, tandem minuta. *Cymae* plerumque 3-5-florae (aliquando redactae)  $\pm$  laxae, foliis floralibus longiores, racemum longum et valde interruptum formantes, inferiores pedunculo capillari 5 mm. longo munitae pedicellis aliquantum brevioribus, bracteis subulatis minutis. *Calyx* tubulosus, superne sensim dilatatus, 2.5-3 mm. longus, 13-nervius, sparse glandulosus et pubescens, fauce nudus, ad quadrantem vel ad quintam partem in dentes triangulares subaequales breviter acuminatos acutos fissus. *Corolla* 6-7 mm. longa, glabra vel  $\pm$  hirtula, lilacina, tubo sensim dilatato paulo exserto ; labium inferius trilobum, lobulis omnibus rotundatis mediano sinuato quam lateralibus et labio superiore emarginato longiore. *Antherae* tubo vix exsertae. *Nuculae* ovatae, 1 mm. longae, 0.5 mm. latae, apice brevissime subapiculatae, sub lente dense papillosae.

TURKEY. Prov. Denizli (Caria) ; Boz Dağ (near Acipayam) above Geyran yaylâ ; 1500-1800 m. ; on outcropping limestone rocks in the black pine forest, local ; flowers mauve ; 16 July 1947, Davis 13422 (type).

**M. cilicica** Hausskn. ex P. H. Davis sp. nov. (Sect. *Pseudomelissa* Benth.). Species valde distincta, a *M. congesta* Boiss. et Hausskn. foliis haud integris calycis dentibus gracilioribus acutis, corollae forma, nuculis tenuioribus haud apiculatis discrepat. A *M. taygetea* P. H. Davis habitu elatiore, foliis majoribus crenato-dentatis, dentibus calycis acutis, corollae forma, nuculis gracilioribus distinguitur.

*Caules* 13-30 cm. alti, ad 1.5 mm. lati, erecti, quadranguli, simplices, breviter velutini, internodiis inferioribus saepe 2 cm. longis. *Folia* ovata, subobtusata, adpresse breviterque velutina, cano-virescentia, petiolo 2 mm. longo, lamina saepe 1.5 cm. longa et 8-9 mm. lata plana remote et minute crenato-dentata, nervis lateralibus 4-5, subtus valde prominenti-



bus. *Folia floralia* inferiora caulinis simillima, superiora elliptico-lineararia sensim diminuentia. *Cymae* 3-6-florae, compactae, foliis floralibus inferioribus breviores, in racemum valde interruptum (3-15 cm. longum) dispositae, inferiores pedunculo 2-3 mm. longo munitae, superiores brevissime pedunculatae, bracteis subulatis minutis. *Calyx* breviter tubulosus, 2 mm. longus,  $\pm$  13-nervius, sparse glandulosus, pubescens, fauce nudus, circiter ad trientem in dentes anguste triangulares acutos  $\pm$  aequales divisus. *Corolla* 6 mm. longa, tubo exserto; labia aequilonga, posterius emarginatum, anterius parce trilobatum lobulo mediano breviter subtriangulari lateralibus ovatis vix brevior. *Nuculae* ovato-ellipticae, obtusiusculae, 1 mm. longae, latitudine  $2\frac{1}{2}$ -plo longiores, sub lente minute pubescenti-papillosae.

TURKEY. Cilicia, 1895, *Siehe* 315 (type).

**M. taygetea** P. H. Davis sp. nov. (sect. *Pseudomelissa* Benth.) a *M. carica* P. H. Davis habitu humiliore, indumento densiore, cymis compactis, dentibus calycis latioribus, nuculis obtusis differt. A *M. congesta* Boiss. et Hausskn. facie humiliore graciliore, foliis minoribus, cymis perpaucifloris racemum minus congestum formantibus, nuculis latioribus obtusis (haud apiculatis) recedit.

*Planta* perennis, saxatilis. *Caules* e rhizomate crasso lignoso erecti, quadranguli, graciles, 4-10 cm. longi (in culti longiores), fere 1 mm. lati, breviter velutini, internodiis ad 1.5 cm. longis. *Folia* late ovata, obtusa, patentia, brevissime et adpresse velutina, canescentia, petiolo ad 3 mm. longo, lamina ad 1 mm. longa et 6 mm. lata, integra vel subintegra, nervis lateralibus subtus  $\pm$  prominentibus. *Folia floralia* inferiora caulinis simillima, superiora elliptico-lineararia, sensim atque valde diminuta. *Cymae* 1-5-florae, compactae, foliis floralibus inferioribus breviores, racemum valde interruptum formantes, inferiores pedunculo 2-3 mm. longo munitae pedicellis brevissimis, superiores brevissime pedunculatae, bracteis subulatis minutis. *Calyx* breviter tubulosus, 2-3 mm. longus, 13-nervius, glandulosus, pubescens, fauce nudus, ad quadrantem in dentes breviter triangulares aequales apice callosobtusiusculo brevissime apiculatos fissus. *Corolla* 6 mm. longa, violascens pubescens, tubo calycem  $\pm$  aequante superne sensim dilatato; labium superius breve, valde sinuatum, inferius paulo longius, trilobum, lobulis omnibus rotundatis sinuatis mediano lateralibus subduplo longiore. *Stigma et stamina* anteriora tubo exserta. *Nux* late ovata, vix 1 mm. longa, obtusa, latitudine  $1\frac{1}{2}$ -plo longior, sub lente minutissime papillosa.

GREECE. Laconia; in rupium calcareorum fissuris montis Taygeti supra pagum Trypi; c. 1500 m.; 2 Oct. 1938, *Davis*. E seminibus in monte Taygeto Laconiae lectis educata, *Barneby & Ripley* (type).

The new *Micromerias* described above are morphologically very well distinguished from other members of the *Pseudomelissa* section, and their precise affinities are not easily determined. The Peloponnesian *M. taygetea* is of particular interest geographically, being related to Asiatic species rather than to any from the Balkans. *M. cilicica* was labelled as a new species under that name by Haussknecht on the herbarium sheet in the Kew Herbarium, but as a description has not been published I have supplied a diagnosis here.

Work on this group of *Micromeris*, which contains many very rare saxatile species, is hampered by the small amount of material in herbaria. Mention should be made of *M. shephardi* Post, originally described from the Syrian desert, of which I have not seen any specimens. In his diagnosis Post compared this species with *M. mollis* Benth., but, so far as one can tell from the brief description and sketchy figure, it is nearly related to *M. congesta* Boiss. et Hausskn. (described from Cataonia) from which it seems to differ chiefly in its larger flowers. Valuable specific characters are found in the form of the corolla and nutlets, but these are seldom referred to in the early diagnoses of the *Pseudomelissa* species.

P. H. D.

#### TEUCRIUM L.

**T. cypricum** Boiss. subsp. **kyreniae** P. H. Davis subsp. nov. a typo habitu laxiore virescente, foliis amplioribus, capitulis et floribus majoribus, laciniis calycis inferioribus manifeste acuminatis, corolla pallidissime citrina (haud pallide fusco-rosea) tubo graciliore divergit.

*Suffrutex* perennis, patule villosa, dense glanduloso-punctata, viscida, aromatica, ramis novellis aliquantum numerosis decumbentibus simplicibus vel sparse ramulosis, 5-15 cm. longis. *Folia* brevipetiolata, obovata, basi cuneata lanato-villosa, virescentia, 4-15 mm. longa, 2-8 mm. lata, praecipue in parte superiore crenulata, plana vel marginibus sub-revoluta. *Capitula* rotunda, plerumque 20-30-flora, 2 cm. lata; folia floralia elliptica, subintegra, calyce vix longiora. *Calyx* brevipedicellatus, tubuloso-campanulatus, extra villosus, intus sparse pubescens, 7 mm. longus, 3 mm. latus, dentibus 3 superioribus triangularibus acutis fere 2 mm. longis, 2 inferioribus triangulari-lanceolatis acuminatis 2.5 mm. longis. *Corolla* pallidissime citrina, 11-12 mm. longa, extra hirsuta, inferne glabra, tubo cylindrico 5 mm. longo, 1 mm. diametro ad faucem pubescente; labii lobus medius  $\pm$  rotundus, 3 mm. diametro, concavus; lobi laterales anteriores oblongi, obtusi, fere 2 mm. longi, marginibus revolutis; posteriores oblongo-lineares, obtusissimi, plani, 3.5 mm. longi, 1 mm. lati. *Filamenta* 3.5 mm. et 5 mm. longa, sparse pubescentes. *Antherae* rubro-fuscae. *Stylus* 0.9-1.2 mm. longus, glaber. *Nuculae* ovatae, reticulo-malleatae, 1.5-2 mm. longae. Floret praecipue probabiliter ad finem veris.

**CYPRUS.** In the following localities of the Kyrenia range:—Yaila; 600 m.; crevices of limestone rocks on N. side; flowers creamy to lemon yellow, plant very aromatic; 23 May 1941, *Davis* 3608. Buffavento; 900 m.; limestone mountain rock; flower yellowish with dull pink; 28 July 1938, *Kennedy* 1502. N. side of Yaila near Halefka; 600-750 m.; saxatile in N. facing cliffs of Trypanian limestone; woody at base, prostrate, corolla yellowish white, plant covered with yellowish viscid glands, very aromatic; 4 Aug. 1940, *Davis* 1921 (type). Larnaca-tis-Lapithou; 300-450 m.; saxatile in sunny limestone rocks; corolla pale creamy yellow, anthers reddish brown; 3 Jan. 1941, *Davis* 2084. St. Hilarion; 690 m.; limestone rocks near the top of castle enclosure, scarce; 24 Nov. 1940, *Davis* 2044. Seen also above Agirdha by Davis.

The new subspecies is separated both ecologically and geographically from the type, the latter being a plant of the igneous central range of Cyprus, while the subspecies is confined to the limestone rocks of the

northern (Kyrenia) range. Similar instances are known of parallel endemics in these two island ranges, treated at specific and subspecific level, in *Arabis*, *Sedum* and *Pterocephalus*. Their occurrence is evidently related to the geological history of the island, the Messaria plain, which now joins the two mountain areas, being apparently under the sea during the latter part of the Pliocene (when the land connection with continent was also broken) and early Quaternary times.

In the central massif *T. cypricum* Boiss., as pointed out by A. K. Jackson (Hook. Ic. Pl. ser. 5. 4, t. 3328) occurs in two forms (modifications ?) related to woodland and exposed sunny habitats respectively. Boissier's type belongs to the woodland form with wider, flatter leaves (fragments of *Pistacia* are lodged in the specimen at Kew) whereas the description of *T. cypricum* Post (later synonym for *T. cypricum* Boiss.) is apparently based on the condensed and woollier sun form having smaller leaves with revolute margins. The latter in cultivation at Kew simulates the shade form in Cyprus.

Specimens of *T. davaeanum* Cosson, endemic to Cyrenaica, have not been seen, but the illustration of this species in Durand & Baratte, Fl. Lib. Prodr. t. 15 (1910) does not convince me that the Cyrenaican plant, with its strongly bullate foliage, is conspecific with *T. cypricum* Boiss. as suggested by Jackson (l.c.). When material of *T. davaeanum* Cosson becomes available it will be necessary to reconsider its status and that of *T. cypricum* Boiss. ssp. *kyreniae* P. H. Davis, in relation to the type of *T. cypricum* Boiss. The Aegean *T. alpestre* S. & S. is less closely related.

N. Y. Sandwith (J. Bot., Lond. 79, 34-35: 1941) has already drawn attention to the occurrence of *Galium recurvum* Req. ex DC. and *Euphorbia sintenisii* Boiss. & Freyn in Cyprus and Cyrenaica, and further stressed the vegetational affinities of Cyrenaica's *altipiano* with the Eastern Mediterranean. In the limestone cliffs of the Kyrenia range two other significant links, besides the *Teucrium*, are found with the Cyrenaican flora: these are the monotypic Ericaceous genus *Pentapera* Klotzsch (represented in Cyprus by *P. sicula* Klotzsch var. *libanotica* Barbey), and *Silene fruticosa* L. (represented in Cyrenaica by ssp. *cyrenaica* Bég. et Vacc.). Both these species have a very disjunct distribution, and though they occur in Sicily, it is noteworthy that neither is found in Crete—an island which shows interesting floral affinities with Cyrenaica, especially in its western part.

*T. cypricum* Boiss. subsp. *kyreniae* P. H. Davis differs from the type in its more lax habit, ampler green leaves, larger heads and flowers, markedly acuminate lower calyx teeth, and pale lemon-coloured (as distinct from very wan brownish-pink) corolla with a more slender tube. Some shade forms of the type recall the plant of the Kyrenia range in habit and leaf, but the floral characters remain constant, and under cultivation the characteristic flower colours of the two plants are maintained. The calyx teeth of *T. cypricum* Boiss. are rarely as blunt as those figured in Hooker's *Icones Plantarum* (l.c.)

P. H. D.

#### GALANTHUS L.

**G. cilicicus** Baker in Gard. Chron. ser. 3, 21, 214 (1897).

LEBANON. Dahr-ul-Baydar (pass between Beirut and Damascus); 17 March 1934, W. A. West.

P. H. D. & F. C. STERN.



**G. fosteri** Baker in Gard. Chron. ser. 3, 5, 458 (1889).

S. LEBANON. Above Jezzin ; 990 m. ; ledge of shady limestone rock with *Scilla cernua* in *Quercus calliprinos*—*Pistacia palaestina* macchie ; leaves flat, flaccid, green ; 14 Mar. 1943, *Davis* 5392.

This species has not hitherto been found south of the Amanus Mountains in Turkey, and constitutes the most southern specific record for the genus. Siehe, however, in a letter to Gottlieb-Tannerheim (Studien über die Formen der Gattung *Galanthus*, in Abhandl. K. K. Zool-Bot. Gesellsch. Wien, 11, (4), 72 : 1904) reports the presence of an unidentified *Galanthus* in the valley of Nahr el Ibrahim, north of Beirut. Dr. N. Feinbrun has kindly confirmed the determination of *G. fosteri* Bak.

P. H. D.

**G. graecus** Orphan. apud Boiss. Fl. Or. 5, 145 (1882).

SAMOS. Mt. Kerkis ; 1200 m. ; collected spring 1940, cultivated in Sussex ; leaves glaucous, somewhat twisted ; *Davis*.

A new record from Samos, though Rechinger (Fl. Aegaea, 735 : 1943) reports *G. elwesi* Hook. from the same locality.

P. H. D.

#### ALLIUM L.

**A. autumnale** P. H. Davis sp. nov. (Sect. *Codonoprasum* (Reichb.) Endl.), ob spatham univalvam et flores valde serotinos *A. callimischon* Link affinis, sed bulbi tunicis senectute haud fibrosis, scapo altiore, spatha umbella  $\pm$  brevior patentem vel deflexam (haud erectam pedicellos amplectantem) tepalis ellipticis fuscis, capsula latiore facile distinguenda.

*Bulbus* ovoideus, ad 2.5 cm. longus et 1.5 cm. latus, tunicis papyraceis albidis externis deinde vix laceratis haud fibrosis. *Scapus* plerumque 25–50 cm. altus, striatus, prope ad apicem vaginatus et foliatus. *Folia* plerumque duo (raro tria), anguste filiformia, ad 40 cm. longa, 2 mm. lata, fistulosa semi-teretia haud vel vix canaliculata, glaucescentia, evanescentia. *Spatha* univalva, lanceolata, in rostrum attenuata, 2–3 cm. longa, umbella plerumque paulo brevior, patens vel deflexa, ad basin pedicellos vix amplectans. *Umbella* 10–30-flora, capsulifera, laxa, pedicellis inaequalibus tenuibus, 1–3 cm. longis, juventute nutantibus, in fructu erectis subfastigiatis. *Perigonium* campanulatum tepalis subconformibus ellipticis obtusissimis fuscis vel roseo-fuscis, plerumque 5–5.5 mm. longis, 2.5–3 mm. latis, dorso obscure lineatis, interioribus manifeste convexis. *Stamina* filamentis anguste lanceolato-subulatis integris perigonio  $\pm$  aequilongis, antheris 1 mm. longis flavis. *Ovarium* anguste ovatum. *Stylus* tandem ad 3 mm. longus, exsertus. *Capsula* matura late obcordata, perigonio paulo brevior, 4.5 mm. longa, 5.5–6 mm. lata. *Semina* subovata, complanata, nigra, breviter rostrata, 3–4 mm. longa, 2 mm. lata. Floret Oct.–Nov.

CYPRUS. Kyrenia district :—Near Myrtou ; 300 m. ; among phrygana on steep marl slopes facing north ; flowering before the rains ; leaves hysteranthous ; tepals brown or pinkish brown with a darker fascia ; spathe 1-valved ; filaments simple ; flowers at first pendant, then held erect on lengthening pedicels ; bulb smelling of garlic ; 14

Oct. 1940, *Davis* 1967 (type). *Vasilia* ; in garigue on limestone and marl hillside ; 3 Nov. 1940, *Davis* 2015. *Akanthou* ; 150–450 m. ; among garigue on north-facing hillsides of limestone and sandstone rock ; leaves coming after rain, somewhat glaucous ; 10 Nov. 1940, *Davis* 2023. *Troödos* range : *Platres* ; 1200 m. ; mountainside under pines ; igneous rock ; tepals dirty white suffused with dull pink, the veins reddish brown ; 2 Oct. 1938, *Kennedy* 1587. East of *Platres* ; banks of *Mesopotamos* road, in the hedge, among vineyards and pine trees ; 1200 m. ; 12 Dec. 1936, *Kennedy* 1588.

The autumn-flowering habit of this very distinct species has no doubt accounted for its being overlooked by earlier botanists. Occurring in very different types of soil, it may well prove fairly widespread, though local, in the lower parts of Cyprus. It normally begins to flower before the autumn rains, the leaves appearing later. *A. autumnale* is so distinct taxonomically that its affinities are hard to determine. In its one-valved spathe and late-flowering habit it resembles *A. callimischon* Link from the south of Greece, the Cyclades and Crete, but differs markedly from that species in the characters cited in the diagnosis.

P. H. D.

#### ORCHIS L.

**O. punctulata** *Stev. ex Lindl. Gen. & Sp. Orch.* 273 (1835).

CYPRUS. Kyrenia district :—Near Myrtou ; 50 m. ; on dry banks, 10 Feb. 1939, *Lady Loch* 67. Between *Ayios Amvrosios* and *Akanthou* ; in shrubby ground ; *Davis* 2172.

These discoveries confirm the solitary record of the species from Cyprus given by Soó (see reference below).

**O. quadripunctata** *Cyrillo ex Ten. Prodr. Fl. Nap.* p. LIII (1811).

CYPRUS. Stavrovouni ; 600 m. ; 28 March 1934, *Syngrossides* 1930 : same locality, up to 900 m. ; in maquis on hillside ; 20 Mar. 1938, *Lady Loch* 43. Lefkara ; chalk hill above town, 660 m. ; 19 Mar. 1946, *Davis* 2769. Limassol district, *Kaminarka* ; on limestone ; 15 March 1941, *Kennedy* (*Davis* 2628).

The discovery of this delightful little species confirms the single record, *Kotschy* 417 from Mt. Buffamente (*Buffavento*), given by Soó (*Rev. Orch. Sudosteur. & Sudwest-asiens ; Bot. Arkiv*, 23, 1928).

V. S. S.

#### PLATANThERA L. C. RICH.

**P. holmboei** *Lindb. in Soc. Scient. Fenn. Årsbok*, 20, B, no. 7 (1942).

CYPRUS. This species apparently occurs in a number of localities at higher altitudes (750–1800 m.) under pines or in garigue by streams, in the igneous *Troödos* massif.

The following specimens are in the Kew Herbarium :—*Kotschy* 755 ; *Feilden* ; *Kennedy* 271–277, 1511–13 ; *Syngrossides* 1593 ; *Davis* 3504.

Certainly quite distinct from *P. chlorantha* (Cust.) Reichb. with which it was formerly identified.

V. S. S.

SPIRANTHES L. C. RICH.

**S. spiralis** (L.) Chevall. Fl. Paris, 2, 330 (1827).CYPRUS. Kyrenia district, Vasilia ; 150 m. ; 11 Nov. 1940, *Davis* 1994.

This is the first record of this species from Cyprus. It is known from Greece, Crete, Asia Minor and Syria.

V. S. S.

## A NEW SPECIES OF ISACHNE FROM INDIA.

N. L. BOR.

**Isachne sikkimensis** Bor, sp. nov. *I. dispari* Trin. similis, sed ab ea spiculis majoribus flosculis similibus haud disparibus, foliorum laminis pilosis recedit.*Gramen* annum. Culmi ad 10 cm. alti, basi decumbentes, radicanes, demum erecti, laeves glabrique, nonnihil purpurei, nodis barbati, striatuli, foliorum vaginis tecti. *Foliorum laminae* ad 7 cm. longae, 7 mm. latae, superiores multo longiores, lanceolato-lineari-acuminatae vel lineari-acuminatae, basi nonnihil rotundatae, utrinque brevissime pilosae, marginibus scabrae ; *foliorum vaginae* laxae, pilosae, inferne nonnullis longis pilis instructae ; *ligula* ad seriem pilorum longorum redacta.*Panícula* brevis, 4 cm. longa, adscendentibus flexuosis minutissime scaberulis ramis ; spiculae longe-pedicellatae ; pedicelli sine glandulis. *Spiculae* 2.25 mm. longae, ambitu ovato-oblongo-acutae vel elliptico-acutae, 2-flores. *Gluma inferior* 2.25 mm. longa, explanata latissime elliptica, apiculata, 5-7-nervis, late marginibus hyalina, ceterum paene coriacea, glabra ; nervi dorso prominentes. *Gluma superior* 2 mm. longa inferior similis. *Anthoecium inferum* ♂ ; *lemma*, a dorso visum, oblongo-ellipticum, 1.5 mm. longum, textu membranaceo-coriaceum, 1-nerve, glabrum laeveque, marginibus anguste inflexum ; *palea* ovato-acuta, lemmati paullo brevior, textu similis ; *antherae* 3.6 mm. longae. *Anthoecium superum* hermaphroditum ; *lemma* a dorso visum ambitu elliptico-acutum, glabrum laeveque, marginibus angustissime inflexum, 1.5 mm. longum ; *palea* lemmati similis sed brevior ; *antherae* 3, 1 mm. longae ; *styli* 2 ; *stigmata* plumosa.SIKKIM. Karponang, 2800 m., 5 Aug. 1945, *Dr. Bor's collector*. (typus in Herb. Kew.) ; Lachoong 3-3500 m., 29 Aug. 1849, *Hooker fil.*



**Bulletin of the Bengal Botanical Society.\*** We are in receipt of the first two numbers of a newly published journal. Each number contains about eighty pages with nine original papers, in various branches of botany. It is gratifying to note some of the interesting and valuable papers on economic and decorative plants like rice, jute, mango, banana and *Bignoniaceae*. It is not possible to discuss the papers individually, and only a few general remarks are given below. It appears that both these numbers were produced somewhat in a hurry as there is a noticeable lack of care in the preparation of the manuscripts and also in their editing. The journal abounds in typographical, orthographical and even taxonomical errors, many of which could have been avoided by an energetic editorial board. It may be possible that some of the errors were due to the authors working in isolation, and in these days of specialisation, such a possibility could not be avoided without assistance from workers in other branches. This is specially noticeable in a paper dealing with the "Fungous flora of Calcutta and suburb." The author has taken considerable pains to cite the correct names and synonyms of the fungi on one hand, and equally neglected the names of the host plants on the other. As a result, he has at least in one instance conveyed an entirely erroneous idea. For example one of the host plants of *Fomes fastuosus* Lev. is given as *Terminalia tomentosa* Mart. ex Eich. [= *Buchenavia tomentosa* Eich.] This plant is a native of Brazil and has not been recorded from India. Evidently, the author has confused it with *Terminalia tomentosa* W. & A., which is an Indian tree.

In the often repeated names of *Tectona grandis* and *Shorea robusta* the names should have been credited to Linn. f. and Gaertn. f. respectively, instead of Linn. and Gaertn. The name *Aegle marmelos* has been wrongly credited to Hook. & Arn. instead of to Correa. Further, the following correct names of host plants should have been used. The correct name stands second.

*Peltophorum ferrugineum* Benth. = *Peltophorum inerme* (Roxb.) Naves.

*Cocoloba nufera* L. = *Coccolobis uvifera* (L.) Bailey.

*Eugenia jambolana* Lam. = *Syzygium cumini* (L.) Skeels.

*Poinciana regia* Boj. ex Hook. = *Delonix regia* Raf.

*Pithecolobium saman* Benth. = *Samanea saman* (Jacq.) Merrill.

*Moringa pterygosperma* Gaertn. = *Moringa oleifera* Lam.

*Artocarpus integrifolia* L. = *Artocarpus integra* (Thunb.) Merrill.

*Pongamia glabra* Vent. = *Pongamia pinnata* (L.) Merrill.

The same reasoning which guided the author to use the correct names of fungi holds good for the phanerogamic plants. The common Bengali name for *Pterospermum acerifolium* Willd. appears to be *Kanak champā* instead of *Muchukunda*—an unfamiliar name.

There are a large number of keen botanical workers in Bengal and for want of a journal, an organised school, although overdue, has not developed. It is hoped that this new journal will bring the workers closer to each other, and we shall look forward with much interest towards further improvements in the journal.

D. CHATTERJEE.

\*Edited by Dr. P. N. Bhaduri ; 35, Ballyganj Circular Road, Calcutta, 19. Annual subscription, Rupees ten or fifteen shillings.

## ADDITIONS TO THE FLORA OF BORNEO AND OTHER MALAY ISLANDS.

XX\*. THE MYRTACEAE OF THE OXFORD UNIVERSITY EXPEDITION  
TO SARAWAK, 1932.

H. K. AIRY SHAW.

**Leptospermum javanicum** *Bl. Bijdr.* 1100 (1826) ; Merr. in *Journ. Str. Br. Roy. As. Soc.* **1921**, Spec. no. (Bibliogr. Enum. Born. Pl.), 436 (1921), et in *Sarawak Mus. Journ.* **3** (4), 533 (1928).

Dulit Ridge, moss-forest, c. 1200 m., 13 Aug., *Native Collector* for *Richards* 1237 : "Shrub or small tree".

Collected many times on Mt. Kinabalu, and obtained by Mjöberg on Mts. Poi and Murud.

**Xanthomyrtus flavida** (*Stapf*) *Diels* in *Engl. Bot. Jahrb.* **57** (3), 363 (in clavi), 366 (1922) ; Merr. in *Sarawak Mus. Journ.* **3** (4), 533 (1928) ; var. **latifolia** *Airy Shaw*, var. nov., foliis 10–13 mm. latis.

Dulit Ridge, open moss-forest on exposed peak, c. 1300 m., 8 Nov., *Richards* 2508 : "Shrub, 2–3 m. high. Flower buds greenish yellow".

In its commonest form, which has been collected many times on Mt. Kinabalu, *Xanthomyrtus flavida* has leaves 4–8 mm. wide, but occasionally, as in *Clemens* 30833 from Penibukan and *Clemens* 32369 from Marai Parai, they may attain a width of 10–11 mm. The present collection from Mt. Dulit possibly represents a local race in which the leaves are constantly broader. The specimen is in young bud only.

**Tristania anomala** *Merrill* in *Journ. Str. Br. Roy. As. Soc.* **1917** (3), no. 77, 227 (1917), et **1921**, Spec. no. (Bibliogr. Enum. Born. Pl.), 435 (1921).

Dulit Ridge, open moss-forest, c. 1230 m., one of the commonest and most characteristic species of the association, 24 Sept., *Richards* 2054 : "Tree, c. 6–8 m. high. Flowers greenish [but specimen in fruit!]. Bark very characteristic (similar in allied lowland species), dark red, very smooth, peeling abundantly in thin longitudinal slightly spiral strips ; rather like that of *Eucalyptus*. Allied to lowland species called *solunsor*".

Represented also by *Beccari* 1860 and 1996, from Sarawak (1865–8), without exact locality.

Although the leaves of this collection reach 6 cm. in length and 2 cm. in width, as against the maxima of 2.5 and 1.4 cm. respectively given in the original description, comparison with a duplicate of the type (summit of Mt. Murud, 1 Dec. 1914, *Moulton* 144) in Herb. Kew. leaves no reasonable doubt as to their conspecificity. *Beccari*'s specimens serve to connect the two.

The previously undescribed capsules are trilocular, the valves ovate, obtuse, 3–4 mm. long and 2–2.5 mm. wide, gaping rather widely at maturity, and surrounded at the base by the persistent calyx.

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\*Continued from *Bull. Misc. Inf., Kew*, **1941** (3), 236 (1942).

**Tristania whitiana** Griff., *Account bot. coll. Cantor* [in *As. Res.* 12—ined.], 3 (nomen), 18 (descr.) (? 1843), et in *Journ. As. Soc. Beng.* 1854, 23, 625 (nomen), 637 (descr.) (1854) ; vel aff.

[*Planchonella obovata* (R. Br.) H. J. Lam in *Bull. Misc. Inf.*, Kew, 1936 (1), 19 (1936), err. det.].

Dulit, primary forest on crest of ridge, under 300 m., 5 Feb., *Richards* 2459 : "Tree, 20 m. high, 28 cm. in diam., bark shed in long brown flakes, which remain attached at the base of the tree, leaving the trunk yellow and very smooth, looking rather like a *Eucalyptus*". Vernacular name, *solunsor* (?).

The material is sterile, but probably represents *T. whitiana* Griff.

### SYZYGIUM

The following species are arranged according to Merrill and Perry's account, "The Myrtaceous Genus *Syzygium* Gaertner in Borneo", in *Mem. Amer. Acad. Arts & Sci.* 18 (3) (*Mem. Gray. Herb. Harv. Univ.* 4), 135–202 (1939).

***Syzygium ramiflorum*** *Airy Shaw*, sp. nov., ex affinitate *S. malaccensis* (L.) Merr. et Perry, *S. rubro-purpurei* (C. B. Rob.) *Airy Shaw*\* et *S. trunciflori* (Ridl.) *Airy Shaw*\*\*, quibuscum inflorescentibus ramealibus paucifloris floribus magnis rubris congruit ; foliis magnis lanceolato-oblongis longe tenuiter caudato-acuminatis basi late cuneatis 1–1.5 cm. petiolatis, nervis supra manifestis sed inconspicuis infra valde prominentibus in nervum intramarginalem valde conspicuum 2–3 mm. intra marginem anastomosantibus differt.

*Arbor* c. 7.5 m. alta (teste *Richards*). *Ramuli* teretes, cortice laevi pallide cinereo, graciles, apice 2 mm. usque (4 dm. infra apicem) 5 mm. diametro ; internodia 5–8 cm. longa. *Folia* oblongo-lanceolata, rarius lanceolata, 24–31 cm. longa, 3.9–6.6 cm. lata, basi late cuneata, apice longe tenuiter caudato-acuminata, cauda 2.5–4.5 cm. longa basi 5–7 mm. lata, chartacea, glabra, siccitate subtus rubido-brunnea supra fusco-brunnea, ut videtur distiche disposita, nervis lateralibus primariis supra inconspicue impressis infra valde prominentibus 25–30-jugis late patentibus subrectis vel leviter procurvis in nervum intramarginalem valde conspicuum usque ad apicem caudae percurrentem 2–3 mm. intra marginem anastomosantibus, nervis tertiariis laxè reticulatis modice conspicuis, costa supra alte impressa infra tereti valde prominente 1.5 mm. diametro, petiolo 1–1.5 cm. longo 2–2.5 mm. diametro tereti rugosulo fusco supra canaliculato. *Inflorescentiae* fasciculiformes, valde pauciflorae (ut videtur 1–2-florae), in axillis foliorum delapsorum ortae. *Flores* purpureo-rubri (teste *Richards*), ex alabastris 2 tantum cogniti. *Pedunculus* subnullus vel 3 mm. longus ; *pedicellus* 3–5 mm. longus. *Calyx* alabastro 12–13 mm. longus, 8–9 mm. diametro, obconico-obovoideus, segmentis 4–5 mm. longis late rotundatis. *Cetera* ignota.

\****Syzygium rubro-purpureum*** (C. B. Rob.) *Airy Shaw*, comb. nov.—*Eugenia rubro-purpurea* C. B. Robinson in *Philipp. Journ. Sci.*, C. Bot., 4 (3), 358 (1909).

\*\****Syzygium trunciflorum*** (Ridl.) *Airy Shaw*, comb. nov.—*Eugenia cauliflora* Ridley in *Trans. Linn. Soc. Lond.* 3, 299 (1893), non (Mart.) DC. (1828) nec Berg (1857). *E. trunciflora* Ridl. *Fl. Mal. Penins.* 1, 724 (1922).



Dulit, primary forest on steep ridge, under 300 m., 17 Aug., *Richards* 1309 : "Tree, c. 25 ft. Flowers magenta." Vernacular name, *ubah keruin*.

In the group of species with rather large red flowers in small inflorescences below the leaves, which are elongate, many-nerved and sometimes finely shagreened on the upper surface, *S. ramiflorum* is perhaps best characterized by its very long-attenuate leaf-apex, with the intra-marginal nerve running up it right to the tip. Its nearest ally is probably *S. rubro-purpureum*, but the flowers of that are considerably smaller. The material of *S. ramiflorum* consists of a single branchlet, 40 cm. long, with five leaves and two large flower-buds only.

***Syzygium castaneum* (Merr.) Merr. et Perry, l.c. 156.**

*Eugenia castanea* Merr. in *Journ. Str. Br. Roy. As. Soc.* **1917** (3), no. 77, 212 (1917).

Dulit Ridge, undergrowth of shady moss-forest, c. 1230 m., 20 Sept., *Native Collector* for *Richards* 1995 : "Shrub, 2-3 m. high. Filaments of stamens white".

This is a small-leaved form, the leaves averaging 4-6 cm. in length and almost exactly matching the smaller leaves on *Haviland* 3218 (Baram, July 1894), a collection not cited by Merrill & Perry. The branchlets are strongly quadrangular, and the inflorescences relatively short, with stoutish branches. I have little hesitation in referring this gathering (no. 1995) to *S. castaneum*, and am reasonably certain that the collections "placed here with some hesitancy" by Merrill & Perry (*l.c.* 157) belong to this species also.

***Syzygium perparvifolium* (Merr.) Merr. et Perry, l.c. 162 (1939).**

*Eugenia perparvifolia* Merr. in *Journ. Str. Br. Roy. As. Soc.* **1917** (3), no. 77, 220 (1917).

"Abundant in forest reserve".

A sterile scrap, without further information ; probably this species.

***Syzygium nummularium* Airy Shaw, sp. nov., *S. perparvifolio* (Merr.) Merr. et Perry affine, a quo foliis exiguis orbicularibus usque rhomboideis 4-8 mm. longis praecipue differt.**

*Fruticulus*, 0.3-0.75 m. altus, ramosissimus, ramis gracilibus  $\pm$  horizontalibus crebre distiche foliatis, ramis vetustioribus teretibus cortice  $\pm$  cinereo, ramulis junioribus alato-quadrangulis  $\pm$  castaneis cito decorticantibus. *Folia* minima, orbicularia usque rhomboidea (raro ovata), 4-8 mm. longa, 3-6 mm. lata, basi rotundata usque late cuneata, apice rotundata usque obtusa, convexa, rigide coriacea, glaberrima, laevia, nitida, siccitate supra rubro-castanea subtus pallida, costa supra argute insculpta subtus fere plana, nervis lateralibus nisi in foliis junioribus omnino obscuris, petiolo brevissimo. *Inflorescentiae* brevissimae, congestae, in axillis superioribus et supremis (praesertim terminalibus) sitae. *Bracteolae* numerosae, obovatae usque spatulatae, 2-2.5 mm. longae, scarioso-castaneae, persistentes. *Flores* circiter 4 mm. longi : calycis tubus (ovarium inferum) angulatus, rugulosus, glaucescens, lobi breviter ovato-deltoides, glauci, submembranacei, 0.8 mm. longi ;

petala ut videtur calyptratim decidua, calyptra 1.5–1.8 mm. diametro ; stamina circiter 4 mm. longa. *Fructus* globosus, 3 mm. diametro, albus, sepalis persistentibus coronatus.

Dulit Ridge, open moss-forest on exposed peak, c. 1250 m., 20 Sept., *Native Collector* for Richards 1981 (typus, Herb. Kew.) : “ Shrub, c. 0.75 m. high. Sometimes epiphytic. Corolla [sic!] of thick pulpy texture, white”.

Gunong Laiun, Sungei Balapau, Ulu Tinjar, moss-forest on summit of mountain, c. 1100 m., 2 Nov., Richards 2417 : “ Shrub, c. 3 m. high. Corolla white”.

This attractive species, with its numerous tiny round leaves, reminding one of some of the small-leaved Asiatic *Vaccinia*, is certainly nearest to *Syzygium perparvifolium* (Merr.) Merr. et Perry in its usually quite invisible nervation. *S. perparvifolium* seems more closely related to *S. bankense* (Hassk.) Merr. et Perry—as suggested by Merrill himself in *Journ. Str. Br. Roy. As. Soc.* 1917 (3), 221 (1917)—than to *S. gaultherioides* (Ridl.) Merr. et Perry, which it follows in Merrill and Perry’s monograph.

***Syzygium foxworthianum*** (Ridl.) Merr. et Perry in *Mem. Amer. Acad. Arts & Sci.* 18, 168 (1939).

*Eugenia foxworthyi* Ridl. *Fl. Mal. Penins.* 1, 728 (1922), non Elm. (1912).

*E. densiflora* var. *angustifolia* Ridl., *l.c.* 729 (1922).

*E. foxworthiana* Ridl., *op. cit.* 5, 308 (1925).

Dulit, river bank, under 300 m., 18 Nov., Richards 2628 : “ Tree, c. 4 m. high. Very abundant and characteristic”.

After studying in some detail the considerable series of specimens, from the Malay Peninsula, Sumatra, Borneo and Java, representing the *pycnanthum* (*densiflora*)-*foxworthianum* complex in Herb. Kew., I am not convinced that more than one species and an often well-marked variety are involved. The characters given by Merrill & Perry, *l.c.*, are usually sufficient for distinguishing them, and herbarium specimens of *S. pycnanthum* usually present a more rugged appearance than those of *S. foxworthianum*, but there are still too many specimens whose identity remains uncertain. Provisionally I follow Merrill & Perry in maintaining *foxworthianum* as a distinct species ; it is evidently almost confined to river-banks, while *pycnanthum* seems to occur in other situations.

***Syzygium hypsipetes*** Airy Shaw, sp. nov., ex affinitate *S. myrtilli* (Stapf) Merr. et Perry et *S. ugoënsis* (C. B. Rob.) Airy Shaw\*, sed foliis late obovatis obtusis ecaudatis multo minoribus 10–17 mm. tantum longis bene distinctum.

*Frutex* circiter 1 m. altus (teste Richards), ut videtur dense ramosus ; rami  $\pm$  stricti et rigidi, usque 5–6 mm. diametro 30–35 cm. infra apicem, vetustiores teretes, cortice plerumque saturate rubido-brunneo interdum cinereo conspicue lamellatim decorticante, ramuli juniores graciles, argute tetraquetri, dense foliosi, internodiis plerumque 5–10 mm. longis. *Folia* late obovata vel elliptico-obovata, 10–17 mm. longa, 8–13.5 mm. lata, basi cuneata, apice obtusa vel rotundata (haud acuminata vel

\****Syzygium ugoense*** (C. B. Rob.) Airy Shaw, comb. nov.—*Eugenia ugoënsis* C. B. Robinson in *Philipp. Journ. Sci., C. Bot.* 4, 389 (1909).

caudata), margine leviter revoluta, rigide coriacea, siccitate olivacea, sub lente crebre punctata, costa gracili supra anguste impressa subtus modice prominente, nervis lateralibus creberrimis gracilibus parallelis adscendentibus subrectis utraque facie permanifeste lineato-prominulis; petiolus brevis, 1-3 (plerumque 2) mm. longus, gracilis, supra canaliculatus. *Inflorescentiae* parvae, terminales et subterminales, subdense corymbosae, circiter 3-12-florae, 1-2 cm. longae (axi floribusque inclusis), axi primario 5-10 mm. longo, axibus secundariis (dum suppetant) brevissimis, omnibus argute tetraquetris glabris. *Flores* circiter 6.5 mm. longi, pseudo-stipitati. *Calycis* tubus obconicus, siccitate plerumque subtiliter striatus, 2-3 mm. longus; lobi distincti, deltoidei, 0.5-1 mm. longi, obtusi, leviter incrassato-convexi. *Petala* distincta, cito caduca. *Stamina* 4-5 mm. longa. *Fructus* ignotus.

Dulit Ridge, open moss-forest, c. 1200-1300 m., 3 Oct., *Native Collector* for Richards 2102: "Shrub, c. 1 m. high".

This is clearly distinguished from *S. myrtillus* and *S. ugoënsis*, apparently its nearest relatives, by its simply obtuse or rounded leaves, lacking all trace of acumen or cusp. The group undoubtedly represents a high-altitude reduction from the widespread *S. lineatum* type.

***Syzygium lineatum*** (DC.) Merr. et Perry in *Journ. Arn. Arb.* **19**, 109 (1938), et in *Mem. Amer. Acad. Arts & Sci.* **18**, 172 (1939).

*Myrtus lineata* Bl. *Bijdr.* 1087 (1826), non Sw. (1788).

*Jambosa lineata* [Bl.] DC. *Prodr.* **3**, 287 (1828).

(For further synonymy see Merrill & Perry, *ll. cc.*).

Dulit trail, primary forest on steep rocky mountain slope, c. 570 m., 25 Aug., Richards 1438: "Tree, c. 87 ft. [26 m.] high, 13" [0.33 m.] diam. Petals white, translucent. Stamens white. Flowers very fragrant. Timber useful". Vernacular name, *ubah kelat*.

Characteristic material of this widely distributed species.

***Syzygium christmannii***\* Merr. et Perry in *Mem. Amer. Acad. Arts & Sci.* **18**, 185 (1939).

Marudi, clearing in 'heath' (white sand) forest, under 300 m., 25 July, Richards 1016: "Tree, 8-10 m." Vernacular name, *ubah*.

This is a very good match in almost every respect for Beccari 3251, the type and hitherto only known specimen of this species. The only differences are in the size of the leaves and colour of branches. The leaves are 9-22 cm. long and 4.5-7.5 cm. wide, but the shape, texture, venation on both surfaces, and madder-brown colour on drying, are identical. The branches are chestnut-brown in colour towards the tips, but further down they become almost as pale as those of the type-specimen. Flower and inflorescence characters appear identical.

***Syzygium attenuatum*** (Miq.) Merr. et Perry in *Mem. Amer. Acad. Arts & Sci.* **18**, 185 (1939), vel sp. aff.

Dulit, primary forest, under 300 m., 12 Nov., *Native Collector* for Richards 2561: "Tree 12 m. high". Vernacular name, *ubah*.

\*This name contravenes Rec. XV (f) of the International Rules; cf. Airy Shaw in *Kew Bull.* **1947**, 35 (1947).



As Merrill and Perry remark (*l.c.* 186), the group of species including *Syzygium rugosum* Korth. 1847, *S. attenuatum* (Miq. 1855), *Eugenia penangiana* Duthie 1878, *E. clavellata* Merr. 1906, *E. clementis* C. B. Rob. 1909, *E. rosenbluthii* C. B. Rob. 1909, *E. purpuricarpa* [sic!] Elm. 1912, and probably others, requires detailed and critical revision. I have considerable doubts as to whether more than one species is represented by the Philippine group of *clavellata*, *clementis*, *rosenbluthii* and *purpuricarpa*. The present collection from Sarawak seems intermediate between *S. attenuatum* and *E. clementis*, agreeing with the former in size of flowers and with the latter in leaf-texture and venation. At this stage, without more copious material and field study, little would appear to be gained either by formally uniting these species or by describing a new one. The precise identity of Richards' collection must for the present be left open.

***Syzygium richardsii*** *Airy Shaw*, sp. nov. peraffinis *S. villamilii* (Merr.) Merr. et Perry, sed foliis amplioribus usque 40 cm. longis et 13 cm. latis textura tenuioribus (unde nervis subtus multo manifestioribus), laminæ basi cuneato-angustata in petiolum circiter 2 cm. longum robustum siccitate fuscum subito contracta specificè differe videtur.

*Arbor parva* (teste *Richards*). *Rami* teretes, graciles, circiter 3 mm. diametro, cinerei (cortice brunneo tenui citodécorticante), internodiis 14–16 cm. longis. *Folia* maxima, oblongo-elliptica, 30–40 cm. longa, 8·5–13 cm. lata, basi cuneato-angustata in petiolum abrupte contracta, apice obtusa vel rotundata, plerumque breviter caudata, cauda plerumque 1·5–2·5 longa interdum brevior vel deficiente 2–3 mm. lata obtusa, margine levissime undulato-crenata anguste sed perdistincte revoluta, tenuiter chartacea, siccitate olivacea subtus pallidiora, costa pro magnitudine folii gracili subtus modice prominente tereti supra anguste impressa (siccitate supra prominente et anguste canaliculata), nervis lateralibus primariis gracilibus 25–30-jugis late patulis leviter procurvis vel basalibus subrectis secundariis tertiariisque parallelis gracillimis obscuris omnibus in nervum intramarginalem gracilem circiter 2·5 mm. intra marginem anastomosantibus; petiolus robustior, 1·5–2 cm. longus, 3·5 mm. latus, supra canaliculatus, siccitate rugulosus, fuscus. *Inflorescentiae* pseudo-terminales, rarius etiam axillares, aperte thyrsoidae, 4–7 cm. longae, 4–6 cm. latae, siccitate nigrescentes, a basi ramosae, ramis superioribus late patulis vel patentibus, bracteis minutis vix 1 mm. longis reflexis. *Flores* (ex alabastris submaturis tantum noti) parvi, in ramulis ultimis per 1–3 laxè subcapitatum dispositi, late obconici, 4–5 mm. longi, 2–2·5 mm. lati. *Calyx* cupularis, margine truncato vel perobscure sinuato-crenato. *Petala* ut videtur calyptratim decidua. *Fructus* ignotus.

Dulit, forest by torrent, under 300 m., 24 Aug., *Native Collector* for *Richards* 1431: "Small tree. Flower buds greenish white".

This is very closely allied to the North Bornean *S. villamilii*, and I was at first inclined to treat it as a variety of that apparently variable species (*cf.* Merrill & Perry, *l.c.* 187). On the whole, however, the differences seem to warrant giving it distinct specific rank: the texture, venation and size of the leaves seem to show significant departures from those of the North Bornean material.

***Syzygium caudatum*** (Merr.) *Airy Shaw*, comb. nov. (non *S. caudatum* Wall. *Numer. List*, no. 3591: 1831, *nomen nudum*), cum descr. amplif.

*Tetraeugenia caudata* Merr. in *Journ. Str. Br. Roy. As. Soc.* 1917 (3), no. 77, 230 (1917), et 1921, Spec. no. (Bibliogr. Enum. Born. Pl.) 435 (1921).

*Arbor* 12·6 alta, caule 12 cm. diametro (teste *Richards*) ; rami graciles teretes, laeves, juniores gracillimi, pallide viriduli, vetustiores usque 4 mm. diametro, pallide brunnescentes vel saepe albidii ; ramuli angulo acuto (30-40°) orti. *Folia* plerumque lanceolata vel ovato-lanceolata, interdum subelliptica vel oblonga, 4-11 (plerumque 7-9) cm. longa, 1·5-4 cm. lata, basi late cuneata sed in petiolum anguste cuneato-decurrentia, apice in caudam longam linearem 1·5-2 cm. longam 1·5-2 mm. latam obtusam sensim vel subabrupte desinentia, tenuiter chartacea, glaberrima, dense minute pellucido-punctata, siccitate viridula vel fusco-viridia, supra nitidula, subtus haud nitentia ; costa gracilis, subtus prominens, supra impressa ; nervi primarii laterales gracillimi, 6-9-jugi, late patuli, circiter 2-3 mm. a margine arcuato-anastomosantes, nervi secundarii tenuissimi, inconspicui, densi, primariis subparalleli ; petiolus gracilis, 4-5 mm. longus, supra e marginibus laminae decurrentibus alte canaliculatus. *Inflorescentiae* minimae, axillares, plerumque triflorae, glabrae, rhachi subnullo usque circiter 5 mm. longo, bracteis bracteolisque minimis acutis. *Flores* minuti, valde inconspicui, clavati, pseudo-stipitati, 2-3 mm. longi, circiter 1 mm. lati, laeves, pallide rubelli (teste *Richards*) ; calycis limbus minute et obscure 4-dentato ; petala ut videtur operculatim caduca ; stamina 4, vix exserta, dentibus calycinis alterna, filamenta subnullo, anthera subglobosa ; ovarium ut videtur uniloculare, ovulis 6! erectis annulatim dispositis, stylo brevissimo subulato, stigmate punctiformi. *Bacca* globosa, usque 1 cm. diametro, alba (teste *Richards*), monosperma ; semen depresso-globosum, 7-8 mm. lata, 5-6 mm. alta, medio longitudinaliter sulcata.

Dulit, primary forest on crest of ridge, under 300 m., 4 November, *Richards* 2398 : " Tree, 12·6 m. high, 12 cm. diam. Flowers pinkish. Fruit white when ripe". Vernacular name, *ubah*.

The above description was drawn up, from *Richards*' material, as representing a new species, before it was realised that the species had already been described as the type of a new genus, *Tetraeugenia* Merr. I am convinced, however, that there is no justification for maintaining either *Tetraeugenia* or *Aphanomyrtus* Miq. (*Pseudoeugenia* Scort.)\* distinct from *Syzygium* Gaertn., of which they surely represent merely the extreme stages in floral reduction. In vegetative characters there is nothing to distinguish them from *Syzygium* ; they totally lack any *facies* of their own. For the same reason I believe that *Acmena* DC. and *Cleistocalyx* Bl. should not be separated from the larger genus ; both contain forms intimately linked with various species of *Syzygium*. With better reason could Miquel's section *Leptomyrtus* be raised to generic rank for the rather distinct group of *Syzygium* with conspicuous bracteoles and glaucous angled calyx-tubes.

*Syzygium caudatum* (Merr.) seems to be closely related to *S. aphanomyrtoides* Merr. et Perry (*Mem. Amer. Acad. Arts & Sci.* 18 (3), 190 : 1939), whilst *S. tenuifolium* (Ridl.) comes near to *S. rhynchophyllum* (Merr.) Merr.

\*See Merrill, " *Aphanomyrtus* Miquel and *Pseudoeugenia* Scortechini", in *Blumea*, Suppl. 1, 107-111 (1937).

et Perry. It would doubtless not be difficult to find relatives in *Syzygium* for the remaining species of *Aphanomyrtus*. In my view, the establishment of independent genera for the ultimate members of demonstrably natural series is much to be deprecated.

I give below a key to this group of very small-flowered *Syzygium* species, followed by the necessary transferences.

Key to *Aphanomyrtus* group of *Syzygium*

Leaves with close parallel venation, the primary lateral nerves not distinctly thicker than the secondaries :

Leaves 2.5–6 cm. long, drying dark reddish-brown or blackish ; inflorescence branched, up to 3.5 cm. long, the branches and pedicels filiform or very slender at flowering time ; flowers about 1 mm. in diameter at anthesis (Malay Peninsula, Sumatra) . . . . . *singaporense* (King) Airy Shaw

Leaves 5–16 cm. long, drying a dull, usually pale, greenish-brown ; inflorescence fasciculate, pedicels thicker, flowers 2 mm. in diameter at anthesis :

Branchlets acutely tetragonal ; stamens 8 (Sumatra, Java) . . . *minimum* (Bl.) A.S.

Branchlets terete ; stamens 6 (Malay Peninsula, Sumatra) . . . *skiophilum* (Duthie) A.S.

Leaves with open venation, the primary nerves (6–16 pairs) much more conspicuous than the secondaries and forming wide loops towards the margin ; inflorescence fasciculate or shortly branched :

Leaves mostly narrowly elliptic-oblong, 6–14 cm. long, 1.5–3 cm. wide, nerves 9–16 pairs ; expanded flowers about 2 mm. in diameter (Malay Peninsula) . . . . . *tenuifolium* (Ridley) A.S.

Leaves lanceolate to ovate-lanceolate, 4–11 (mostly 7–9) cm. long, 1.5–4 cm. wide, nerves 6–9 pairs :

Cauda of leaves about 1 cm. long ; inflorescence branched, up to 2 cm. long, with slender branches ; expanded flowers about 2 mm. in diameter (North Borneo) . . . *aphanomyrtoides* Merr. et Perry

Cauda of leaves 1.5–2 cm. long ; inflorescence greatly reduced, less than 5 mm. long, about 3-flowered ; expanded flowers about 1 mm. in diameter (Sarawak) . . . *caudatum* (Merr.) A.S.

***Syzygium minimum*** (Bl.) Airy Shaw, comb. nov.

*Eugenia minima* Bl., *Cat. Gew. Buitenz.* 75 (1823).

*Aphanomyrtus minima* (Bl.) Merr. in *Blumea*, Suppl. 1, 108 (1937), which see for full synonymy.

***Syzygium singaporense*** (King) Airy Shaw, comb. nov.

*Aphanomyrtus rostrata* Miq. *Fl. Ind. Bat.* 1 (1), 481 (1885) ; Merr. *l.c.* 109\*, *q.v.* ; non *Syzygium rostratum* (Bl. sub *Calyptantho*) DC. *Prodr.* 3, 261 (1828).

*Pseudoeugenia singaporensis* King in *Journ. As. Soc. Bengal*, 70 (2), 133 (1901).

***Syzygium skiophilum*** (Duthie) Airy Shaw, comb. nov.

*Eugenia skiophila* Duthie in Hook. fil. *Fl. Brit. Ind.* 2, 486 (1879).

*Aphanomyrtus skiophila* (Duthie) Merr. *l.c.* 110, *q.v.*

***Syzygium tenuifolium*** (Ridley) Airy Shaw, comb. nov.

*Pseudoeugenia tenuifolia* Ridley in *Bull. Misc. Inf.*, Kew, 1929, 123 (1929).

*Aphanomyrtus tenuifolia* (Ridley) Merr. *l.c.* 110.

*APHANOMYRTUS ALATA* Lauterb. in Lorentz, *Nova Guinea*, 8, 854 (1912) ; Merr. *l.c.* 111 = ***Syzygium alatum*** (Lauterb.) Diels in *Engl. Bot. Jahrb.* 57, 411 (1922).

***Syzygium griseum*** (C. B. Rob.) Airy Shaw, comb. nov.

*Eugenia grisea* C. B. Robinson in *Philipp. Journ. Sci.*, C. Bot. 4, 395 (1909) ; Merr. *Enum. Philipp. Flow. Pl.* 3, 167 (1923).

\*The specimen Corner 28179, referred to this species by Merrill, *l.c.* 110, represents a species of *Syzygium* allied to *S. myrtifolium* (Roxb.) DC.



Dulit trail, rocky primary forest in valley, under 300 m., 10 Aug., *Richards* 1188 : " Tree, height about 90 ft. [27 m.]. Diam. above buttresses c. 14" [0.35 m.]. Buttresses high, not wide-spreading. Bark smooth, with slight annular markings, not longitudinally furrowed. Wood pale brown ; heart wood darker". Vernacular name, *ubah puteh*.

The material was collected apparently at the extreme end of its flowering period and almost all the flowers have fallen and very few of the remainder show signs of setting fruit. There may be thus a slight doubt as to the identification, but I think it is correct. *S. griseum* is, as Robinson remarks, very closely related to the Javanese *Eugenia jamboloïdes* Koord. et Val., judging by two non-authentic specimens of the latter present in Herb. Kew. Without more ample material, however, it would be unwise to express a positive opinion as to its distinctness or otherwise. It is perhaps significant that the Philippine and Bornean specimens dry olive-green, while the Javan ones dry pinkish-brown.

**Syzygium incarnatum** (Elm.) Merr. et Perry, l.c. 195 (1939), *sensu lato*.

*Eugenia incarnata* Elm. *Leafl. Philipp. Bot.* 4, 1416 (1912).

Dulit Ridge, moss-forest, c. 1230 m., 8 Sept., *Richards* 1625 : " Tree, c. 10 m. high".

This gathering differs from typical *S. incarnatum* in the rather more thickly coriaceous leaves and stouter, less elongate branches of the inflorescence. As Merrill and Perry remark (*l.c.*) the species is a somewhat variable one, and in the present state of our knowledge I prefer to include this specimen within its range. A specimen from North Borneo (Benoni, Papar, sandy land, 18 April, 1932, *Bakar* in *B.N.B. For. Dept.* 2368) exhibits similar inflorescence-characters, but the leaves are typical.

## A NEW VARIETY OF *BRACHIARIA LATA* FROM WEST TROPICAL AFRICA.—

*Brachiaria lata* is a common annual grass with a wide area of distribution in northern tropical Africa extending from French Guinea through the drier parts of west tropical Africa to French Equatorial Africa, Anglo-Egyptian Sudan, Eritrea, Abyssinia and tropical Arabia. With the exception of two gatherings possessing pubescent glumes and lower lemma and here named var. *pubescens*, all the numerous specimens examined have perfectly glabrous spikelets. The glabrous-spiculate variant, var. *lata*, includes the type of the species, of which the more important synonyms are listed below.

***Brachiaria lata*** (Schumach.) C. E. Hubbard in Hook. Ic. Pl. 34 : sub t. 3363, p. 2 (1938).

1. Var. ***lata*** (Schumach.) C. E. Hubbard, stat. nov. Spiculæ glabrae. *Panicum latum* Schumach. Beskr. Guin. Pl. 61 (1827). *P. insculptum* Steud. Syn. Pl. Glum. 1 : 49 (1854). *Urochloa insculpta* (Steud.) Stapf in Prain, Fl. Trop. Afr. 9 : 599 (1920). *U. lata* (Schumach.) C. E. Hubbard in Kew Bull. 1934, 112.

2. Var. ***pubescens*** C. E. Hubbard, var. nov. ; a var. *lata* glumis et lemmate infero dense pubescentibus differt.

GOLD COAST : Northern Territories ; Birifu, near Laura, waste ground, August 1948, *Thorold* 216.

NIGERIA : Sokoto Province ; Sokoto, common in fields, July 30, 1910, *Dalziel* 477 (type).—C. E. HUBBARD.

**The Cultivated Conifers.\*** For many years Dallimore and Jackson's "Handbook of Coniferae" has been a standard work of reference. Outwardly, the third edition appears very little different from its predecessor, but nevertheless it contains a hundred extra pages. This miracle of compression is achieved by the use of a thinner paper of better quality, which incidentally has improved slightly the rendering of the figures. The text, on the whole, remains as hitherto, the additional matter being interpolated in the form of notes on cultivation and on reactions of many species to the British climate, as well as brief monographs of further species, varieties and hybrids.

One of the principal criticisms of earlier editions was the poor arrangement of the keys, which were often difficult to follow. A very considerable improvement has now been made by lettering the alternatives, adequate indenting of the text and placing the scientific names always at the right hand edge of the page. It was a great misfortune that Jackson died before he had time to do more than revise the key to the genera, for there is still much room for improvement in the keys to the species. These are usually not dichotomous, as there are frequently four and occasionally five alternatives from which to choose. The difficulties are increased when the criteria for the separation of groups of species overlap, for example in the five-needle pines. Here four groups with non-persistent leaf sheaths are distinguished: B. young shoots glabrous; BB. minutely pubescent; BBB. with short, glandular hairs and BBBB. young shoots with thinly arranged pubescence or sometimes glabrous. Such lack of prevision may entail checking over the whole of the major group when attempting an identification. Confusion is added in this instance by describing *Pinus lambertiana* in the key with brown glandular hairs, but nevertheless placing it in the second subgroup BB.

The nomenclature has been revised to bring it into conformity with the International Rules, using as authorities the Kew "Handlist of Coniferae" and Rehder's "Manual of cultivated trees and shrubs." Some errors have crept in, however, mostly by the citation of invalid polynomials obtained by omitting the quotation marks used in the Kew list, such as *Cryptomeria japonica* var. *elegans compacta* Hort. At one point Rehder is followed so slavishly that one finds *Pinus nigra* var. *pyramidalis* Slavin, f. The authority is not Slavin filius; this is merely Rehder's method of indicating that Slavin regarded this unit as a *forma*, as the comma shows.

Another eight plates have been included without adding to the bulk by printing on both sides of the paper. Among the new pictures is one of *×Cupressocypris leylandii* grown from a cutting in Dallimore's own garden and now 30 ft. high after 13 years. A full account of this hybrid is given in the text. Other new plates depict *Cunninghamia lanceolata*, *Picea omorika* and *Pinus greggii*, all growing in the National Pinetum at Bedgebury. On the whole the volume has been considerably improved and the few minor defects remaining do not detract much from a work of such outstanding merit.

R.M.

\* A Handbook of Coniferae including Ginkgoaceae, by W. Dallimore and the late A. B. Jackson. Ed. 3, pp. xvi + 682, figs. 120, tt. 39, 1948. E. Arnold & Co., London, 50/-.

## THE REDISCOVERY OF THE TYPE SPECIMEN OF MICRODICTYON UMBILICATUM (VELLEY) ZAN.

HELEN BLACKLER

I wish to record the rediscovery of the type specimen of *Microdictyon umbilicatum* (Velley) Zan., the location of which has hitherto been unknown.

Setchell when writing his paper on the genus tried to locate all the type specimens of the different species, in the large herbaria of the principal museums of the world, but many enquiries failed to find *Conferva umbilicata* Velley; the oldest known member of the group. Harvey's plant no. 568, was taken as the holotype, the material being from the same locality, off the coast of New South Wales, and apparently similar in most respects with the published description and illustrations by Velley in the Transactions of the Linnean Society vol. 5. 1800.

Velley's Herbarium including his marine plants, the majority bound in eight volumes, with annotations and water colour sketches, and some three hundred odd species unbound, were bought by the Liverpool Botanic Gardens Committee through the generosity of William Roscoe in 1810, and are now in the Free Public Museums, Liverpool.

Some time ago when working in the Liverpool Museum, having read Setchell's paper, the possibility of the existence of the type specimen of *Conferva umbilicata* Velley, in the collections in Liverpool seemed probable. The illustration in the Transactions of the Linnean Society recalled an alga in the herbarium known to be incorrectly labelled *Hydrodictyon*. After careful examination of this material, no doubt was felt as to its identity as the lost type. The shape, lacerated outline, venation, and structure, as far as can be ascertained with a lens from the dried material, agree with plates in Velley's paper. From the colour of the pressed plant it is understandable that at first sight it might be mistaken for a dead leaf in the process of decomposition into a skeleton, as Velley thought it was until a more detailed investigation revealed its nature. The specimen is mounted on paper identical with that used for his other algae, but was pinned to a large sheet annotated as *Hydrodictyon reticulatum* at a later date.

In Volume II, on sheet 93, is an unnamed piece of *Ecklonia radiata* and in Dawson Turner's "Fuci" this species is figured as *Fucus radiatus*. He stated that it was "communicated to me many years ago by the late Col. Velley to whom it was sent from New Holland together with *Conferva umbilicata* by Governor Hunter." Velley obtained his *Conferva umbilicata* (Microdictyon) from the stalk of the Fucus after soaking it in water for two or three days, when a greyish film was seen, which on examination he decided was a new species. He read a paper describing this alga before the Linnean Society on July 2nd, 1799, which was afterwards published in their Transactions (vol. 5, 1800). This type specimen is now in the Free Public Museums, Liverpool, available for consultation.

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Turner, Dawson. "Coloured figures and descriptions of the Plants referred to by Botanists as the Genus *Fucus*". 1808.

Velley, T. "Description of *Conferva umbilicata*, a new Plant from New South Wales". Trans. Linn. Soc. **5**. 1800.

**Plants in Zanzibar and Pemba\***—It is pleasing to welcome the appearance of a book of this sort as relatively little, either of a technical or of a popular nature, has been published on the plants or plant life of East Africa. The author, who is Director of Agriculture, Zanzibar, received his early training at Kew and has had a long experience of horticultural, agricultural and botanical work in the tropics and subtropics.

Many will be familiar with *The Useful and Ornamental Plants of Trinidad and Tobago* written by Mr. Williams and his son while resident in Trinidad. A fourth and revised, illustrated edition of this useful book for the West Indies is now in the course of production. The present work is modelled on precisely similar lines, although considerably larger. It should prove equally useful, not only for Zanzibar and Pemba, but for East Africa as a whole, particularly the coastal areas.

The first hundred pages of the book (Part One) are devoted to general or introductory matter. This includes a useful list of the economic plants arranged according to subjects, e.g. fruits, vegetables, fibres, timbers, etc. This should enable a newcomer to see at a glance what fruits may be seen, or any other group of economic plants in which he or she may be interested. A similar list is provided for the ornamental and garden plants. Any garden enthusiast may see immediately which annuals, perennials, climbers, shrubs, hedges, pot or basket plants are the best suited for cultivation.

In the second or main part of the book the various plants are described individually in detail, the space allotted to each depending upon its importance or the interest attached to it. The arrangement adopted is alphabetical, with ample cross references, which is the best possible for a work of this sort intended primarily as a reference book for the general public. It is here that the author's wide knowledge and experience of tropical economic and ornamental plants has obviously been of great value and has enabled him to strike a happy balance in the allocation of space for the large number of species with which he has had to deal. Native or Swahili names are quoted freely, which should prove a great advantage. Another feature of the book, which should enable many plants to be easily recognised, is the large number of illustrations (over 170)—mainly line drawings with a few photographs. Several contributors have supplied these and they vary somewhat in their merit but collectively they constitute a valuable feature of the book.

To anyone resident in, or proceeding to, East Africa who is in any way interested in plants or gardening, the book may be safely recommended. The author is to be congratulated on the task he has accomplished, especially as it has been done "in such spare time as he has had in the space of two years."

F. N. Howes.

\*The Useful and Ornamental Plants in Zanzibar and Pemba by R. O. Williams O.B.E. Crown Agents, London: Govt. Printer, Zanzibar, 1949, pp. 497, Price 21s. net.

## A NOTE ON ACACIA DUDGEONI CRAIB.

R. W. J. KEAY AND J. P. M. BRENNAN.

*Acacia dudgeoni* Craib ex Holland in Kew Bull., Add. Series IX, 291, 1911 (December), and in Kew Bull. 1912, 98, was included in *Acacia senegal* (L.) Willd. by Hutchinson and Dalziel in the Flora of West Tropical Africa 1, 361 (1936). A recent examination of the material at Kew and other herbaria, and of the two species in the field in Nigeria, shows that Craib's species is validly distinct.

The type specimens, *Dudgeon* 58 (Borgu, Nigeria) and *Dalziel* 41 (Kontagora, Nigeria), are at Kew. Several other specimens, which have previously been named *A. senegal* in British herbaria, agree very well with the type specimens of *A. dudgeoni*, as does the specimen (*Keay, Forest Herb., Ibadan No.* 16001) recently collected by one of us in northern Oyo Province, where it is common. Craib separated *A. dudgeoni* from *A. senegal* only by the more numerous pinnae and leaflets and thinner fruit-valves. This comparison can be amplified as follows :—

**A. dudgeoni** :—Pinnae 8–16 pairs ; leaflets up to 24 pairs ; margins slightly revolute, more or less parallel but leaflets slightly broader at the rounded apex, about 3 mm. long and 0.8 mm. broad ; petiole and rhachis of whole leaf and of pinnae more densely pubescent when young ; fruit almost glabrous when mature, chestnut-coloured to pale chestnut-brown, mottled ; seeds purplish-brown.

**A. senegal** :—Pinnae up to 6 pairs, usually 4 or 5 ; leaflets up to 15 pairs, oblong, not broader at the apex except in the uppermost leaflets, narrowed above to an obtuse or slightly pointed apex, about 4 mm. long and 1 to 1.25 mm. broad ; fruit more or less densely appressed-pubescent when mature, fawn to pale olive-brown ; seeds olive-brown.

The following additional material should be referred to *A. dudgeoni* Craib :—

FRENCH SUDAN.—Satadougou, *Irvine* 3214 (Herb. Imp. For. Inst., Oxon. and Herb. Paris), fls. May 1939.

GOLD COAST.—Pan to Bujan, *Kitson* 594 and 595 (Herb. Kew.), fls. 18 April 1927 ; Tamale, *Lloyd Williams* 115 (Herb. Kew.) fls. 8 April 1928 ; N. Gambaga district, *Lloyd Williams* 490 (Herb. Kew.), fls. 27 March 1930 ; Yendi, *Vigne* 1686 (Herb. Imp. For. Inst., Oxon. and Herb. Paris), fls. April 1929 ; Nangodi, *Vigne* 3329 (Herb. Imp. For. Inst., Oxon.), sterile July 1934 ; Bawku, *Vigne* 3754 (Herb. Imp. For. Inst., Oxon. and Herb. Paris), fls. and frts. April 1935.

NIGERIA.—Oyo Province, Old Oyo Forest Reserve, *Keay, Forest Herb., Ibadan No.* 16001 (Herb. Kew. and Herb. Imp. For. Inst., Oxon ex Ibadan), fls. and old frt. 19 February 1946.

Our description of *Acacia senegal* (L.) Willd., *sens. strict.* is based on the following West African material :—

SENEGAL.—*Heudelot s.n.* (Herb. Kew. and Herb. Fielding, Oxon.) fls. and frts. 1839. It is quite likely that this represents one of the gatherings used by Guillemain and Perrottet in describing their



*Acacia verec* in *Florae Senegambiae Tentamen* 1, 245, t. 56 (1832). Sor Island, *Brunner* 9 (Herb. Kew.) \*M. Bidjem, *Ex Herb. Franqueville* (Herb. Kew.), fls. May 1865.

NIGERIA.—Katagum District, *Dalziel* 55 (Herb. Kew.), fls. and frts. 20 July 1907 ; Bornu Province, Geidam, *Dudgeon* 1 (Herb. Kew.) frts. October ; Bornu Province, Gujba, *Foster* 80 (Herb. Kew.), fls. 24 December 1916 ; Bornu Province, Maiduguri, *Kennedy* 2932 (Herb. Imp. For. Inst., Oxon.) frts., without date ; Bornu Province, Damaturu, *Keay, Forest Herb., Ibadan No. 7575* (Herb. Imp. For. Inst., Oxon. ex Ibadan), fls. 3 July 1944 ; same locality, *Kennedy, Forest Herb., Ibadan No. 7268* (Herb. Imp. For. Inst., Oxon. ex Ibadan) fls. July 1944 ; Sokoto Province, Zamfara Forest Reserve, *Keay Forest Herb., Ibadan No. 16145* (Herb. Imp. For. Inst., Oxon. and Herb. Kew. ex Ibadan), fls. and old frt. 15 April 1946 ; same locality, *Keay, Forest Herb., Ibadan No. 16169* (Herb. Imp. For. Inst., Oxon., Herb. Kew., Herb. Brit. Mus. and Herb. Gold Coast Forest Dept., ex Ibadan), fls. and old frt. 20 April 1946.

From the description, it appeared to us that *Acacia samoryana* A. Chev. in Bull. Soc. Bot. Fr., Mém. VIII D, 167 (1911) must be very close to or identical with *A. dudgeoni* Craib. The type of *A. samoryana* is *Chevalier* 24326 from Dahomey. In Herb. Kew. there is a drawing and fragment of *Chevalier* 24236 from Gourma. The fragment consists only of a single leaf but agrees well enough with *Dudgeon* 58. It is possible that this is in fact a fragment of the type of *A. samoryana* and that an orthographical error has been made in numbering. Because of the inadequacy of the material and the uncertainty about the number, however, we sent to Paris duplicates of *Irvine* 3214, *Vigne* 1686 and 3754 with the request that they should be compared with the type of *A. samoryana* A. Chev. as there is no authentic material in Britain. By the courtesy of the Director of the Muséum Nationale d'Histoire Naturelle, these specimens were compared by Professor F. Pellegrin who writes as follows :—" Les trois numéros . . . sont tous les trois des *Acacia Samoryana* A. Chev. Mais il y a des formes transitoires et cette espèce peut n'être considérée que comme variété par certains auteurs." We, however, consider *A. dudgeoni* and *A. senegal* to be specifically distinct.

This determination proves therefore that *A. dudgeoni* Craib and *A. samoryana* A. Chev. are the same. According to the printer's note on page 177 of Kew Bull., Add. Series IX, part II, this work was published in December 1911 ; a footnote on the cover of Bull. Soc. Bot. Fr. Mém. VIII D shows that this was published on March 2nd 1912. *Acacia samoryana* A. Chev. is therefore antedated by *A. dudgeoni* Craib ; this is indeed unfortunate as *A. samoryana* has long been recognised in French West Africa as a distinct species, but neither species has previously been recognised (except by Craib) in British West Africa since, as we have said, both were reduced to synonyms of *A. senegal* (L.) Willd. in the Flora of West Tropical Africa.

A revision of the West African acacias in the Genevan herbaria by Roberty has appeared very recently (*Candollea*, 11, 113-174 : 1948).

\* M. Bidjem or Mbidjem is a place near the coast a short way from Dakar, on the St. Louis side, in Senegal ; and not a collector named Bidjem, as was assumed by Oliver in Fl. Trop. Afr. 2, 342 (1871).



Roberty fails to mention *A. dudgeoni* at all, but *A. samoryana* is placed as *A. senegal* Willd. subsp. *senegalensis* (Houtt.) Roberty var. *samoryana* (A. Chev.) Roberty, the variety being merely regarded as a modification of the subspecies with "feuilles plurifoliolées et multifoliolulées". We need hardly say that we emphatically disagree with this view. Roberty's taxonomy is open to much criticism on other grounds, as will be realised when it is stated that he regards *A. senegal* as an "omnibus" species including inter alia (as subspecies) not only *A. latea* R. Br. ex Benth. but also *A. mellifera* (Vahl) Benth.!

The geographical distributions in West Africa of *A. senegal* and *A. dudgeoni* (*A. samoryana*) are quite distinct, as has long been recognised by French workers. *A. senegal*, the well-known source of Gum Arabic, is abundant in the Sahel zone, its southern limit corresponding roughly with the 500 mm. isohyet, according to Aubréville (The Niger Colony Forestry Expedition 1935, English translation, Ibadan 1937). On the sandy soils of Bornu (Nigeria), however, it is common as far south as the 700 mm. isohyet in the Sudan zone. *A. dudgeoni* is a plant of the Guinea Zone in Nigeria, with a distinctly moister climate (mean annual rainfall round about 1,200 mm.).

We have seen no specimens of true *Acacia senegal* from the Gold Coast, where *A. dudgeoni* is the common species.

In East Tropical Africa *A. senegal* has a wide distribution but *A. dudgeoni* is apparently absent.

**The Fig.** Adam and Eve, without using clothing coupons and without recourse to the black market, made themselves aprons of fig-leaves. In a recent book on the fig, however, Prof. I. J. Condit inclines to the belief that the foliage employed to make the garments demanded by newly acquired modesty came from some other species of *Ficus* than *F. carica*. Be this as it may, the common fig has had a long and intricate history as a plant used and spread by man. It was probably first cultivated in the more fertile part of southern Arabia. The reference to "wild specimens, such as those reported in 1923 by C. M. Doughty" is misleading, since the date is that of an American edition of Doughty's "Travels in Arabia Deserta." This classic was first published early in 1888 (see *The Periodical* **13**, 188 : 1928). In ancient, if not in prehistoric times, fig cultivation spread rapidly through Mediterranean lands and, more slowly, eastwards. Now, figs are grown in the Old World and the New, in the Northern and the Southern Hemispheres.

Prof. Condit not only describes the history and distribution of the fig but outlines its botanical characters, the breeding of new varieties, the characters of older varieties, the fig districts of the world, the ecology, propagation, and culture of figs, and the economics, chemistry, diseases, and pests of the crop. There is a very long bibliography.

Caprification, the process by which pollen is transferred by the fig wasp, *Blastophaga psenes*, from the caprifig to the edible fig, has a chapter to itself. Theophrastus gave a very clear general account of caprification though his explanation was incorrect in some details. Usually a single fig tree bears syconia with flowers either all long-styled (edible figs) or all short-styled (caprifigs). The *blastophaga* oviposits in the latter. Staminate flowers are commonly located in a mass just below the scales lining the opening of the caprifig. The male wasp issues from a female flower and impregnates the female while she is still inside the fig ovary. When the female emerges she creeps out through the opening in the syconium dusting herself with pollen as she does so. She crawls over the surface of leaves and fruits and makes short flights. Females entering young caprifigs (profichi) deposit an egg in every pistillate flower and die after oviposition is completed. Inside edible figs the females cannot oviposit in the long-styled flowers and they perish after their futile attempts to perpetuate their species but not before pollination has been accomplished. Some varieties of edible fig are parthenocarpic and do not require caprification.

The author states definitely that this book is not intended to be a text book or a manual on practical fig culture. He has achieved his two purposes of gathering into one volume very numerous essential facts regarding the fig and of enabling his readers to share the results of his own studies and researches in California.—W. B. Turrill.